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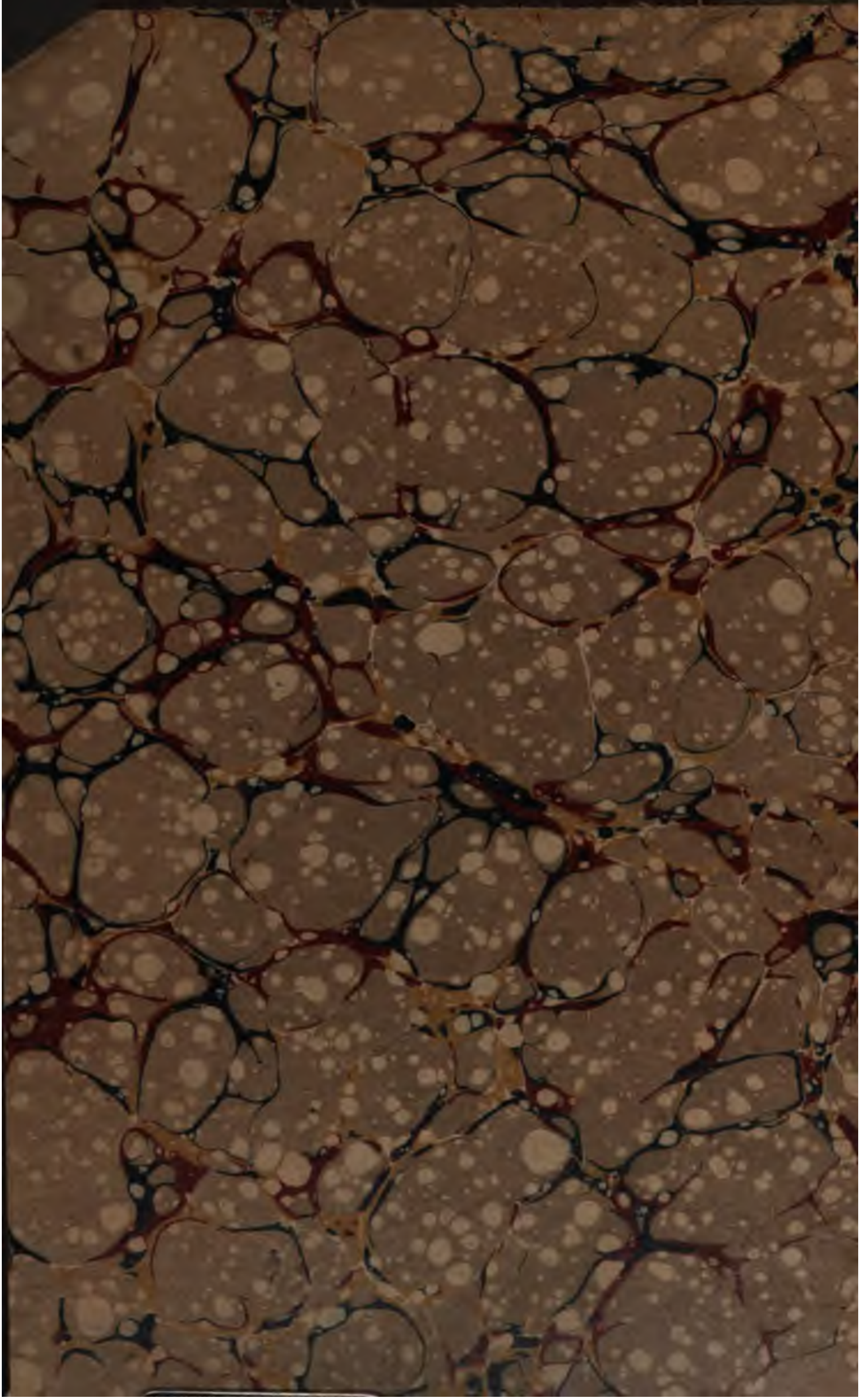

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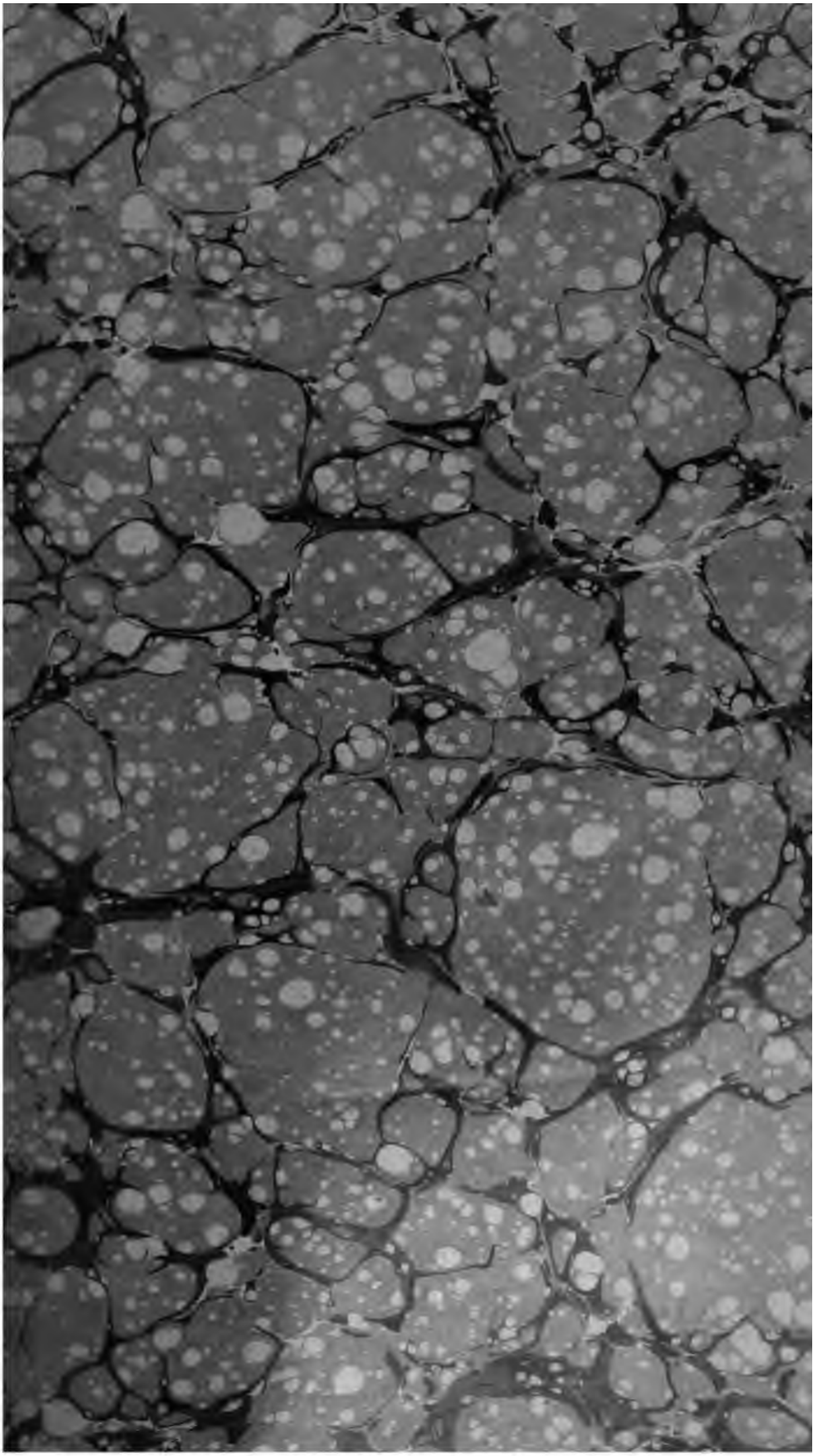

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I.—*Descriptions of New Species of Birds of the Genera* ORTYX Stephens, STERNA Linn., *and* ICTERIA Vieillot.

By GEO. N. LAWRENCE. *Read Feb.* 14, 1853.

Ortyx Texanus.

TEXAN PARTRIDGE OR QUAIL.

Adult Male. Front and lores white; the feathers of the crown are brownish black, bordered with pale rufous; a yellowish-white line extends over the eye and down the side of the neck; auriculars pale rufous; feathers of the hind part and sides of the neck black, marked with rufous in their centres, and with white on their margins; upper part of the back pale rufous, each feather crossed with curving bars of black; middle of the back and rump finely mottled with brownish-black, pale rufous, and yellowish-ash in different shades; upper tail coverts dull rufous, brown along their shafts, and crossed with irregular whitish bands, they extend nearly to the end of the tail; primaries brownish-ash, with the edges of the outer webs greyish-white; secondaries also brownish-ash, margined with very pale rufous; tertiaries and scapulars mottled with brownish-black, rufous, and greyish-ash, and margined with pale rufous white; smaller wing coverts ash; the others light rufous, barred with black; tail bluish-ash, lightly mottled with greyish-white and pale rufous, the two central feathers are darker and more distinctly marked; throat white, bordered by a narrow line of black, commencing under the eye and becoming broader on the neck in front; below this the neck is pale dull rufous; breast and abdomen greyish-white, tinged with pale rufous-yellow, and crossed with rather broad curving bars of black; sides of the breast and body rufous, with roundish white spots partially encircled with broad markings of black; under tail coverts rufous, paler at the ends, and marked with arrow heads of black along the shafts; bill black; legs and feet yellowish brown in the dried specimen.

Length of the skin, 8 inches; wing from flexure, 4¼ inches; tarsus, 1⅛ inches; bill along the ridge, $\frac{9}{16}$ inch; tail, 2 inches; middle toe and claw, 1⅜ inch.

This somewhat resembles *O. Virginianus*, but is smaller, and differs also in having the lores white, in being without the conspicuous dark markings on the back and wings, and the bright chestnut red so prevalent in the upper plumage of that species; the bill is proportionately longer and narrower, the legs more slender, and the black markings on the abdomen and breast are fully twice as broad.

appearance and habits it was somewhat like the Virginia Partridge, but the note or call was quite distinct.

Sterna Pikei.

SLENDER BILLED TERN.

Hind part of the crown, occiput, and sides of the head including the eyes, black; front and loral space white, minutely speckled with blackish-grey; dorsal plumage and wings bluish-pearl color; the upper edge of the wing, white; smaller wing coverts dark plumbeous; outer web of the first primary brownish-black, a dusky line runs the whole length of the inner web next the shaft, inner edge, white; the other primaries are dark bluish-grey on the outer webs, at the end and on the inner webs next the shaft, with the inner margins white; inner webs and tips of secondaries, white; upper tail coverts white; outer webs of the long lateral tail feathers, greyish-black, with their ends white, inner webs white, with a dusky space near the tips; the two central feathers, greyish, but white along the shafts; all the other tail feathers white on the inner webs, and greyish on the outer; throat, neck all round, and entire under surface, white; the bill is probably deep crimson in the living bird, in the specimen it appears dark brown, tinged with deep red, at the edges and on the inside; tarsi and feet appear to have been orange; the tibia feathered nearly to the joint.

Total length of skin, 13 inches; alar extent, 23½ inches; wing from flexure, 9 inches; tail to end of longest feather, 5½ inches; tail to centre of fork, 3 inches; bill along the ridge, 1⅛ inch; tarsus, ½ inch; middle toe and claw, 1⅜ inch; hind toe and claw, ¼ inch.

Bill slender, tarsi remarkably short, feet small.

It was obtained near the coast of California, in the vicinity of Monterey.

From the cabinet of Nicolas Pike, Esq., of Brooklyn, L. I., a gentleman who has for some years devoted much time to the study of different branches of our Natural History; to whom I take pleasure in dedicating this species.

Icteria Longicauda.

LONG-TAILED CHAT.

Upper plumage dull olive green, inclining to brown on the head; wings and tail light brown, edged with olive green; a line from the nostrils over the eye, eyelids, and a line from the lower mandible down the side of the neck, nearly three fourths of an inch in extent, white; lores, black; throat and breast, orange yellow; under wing coverts yellow; sides, dark ash; abdomen and under tail coverts ashy white; bill, black; edges of both mandibles and an oblong spot on the lower, near the base, greyish-white; legs and feet in the dried specimen, dusky brown.

Length of skin, 7¾ inches; wing from flexure, 3⅛ inches; bill, $\frac{9}{16}$ inch; tarsus, 1 inch; tail, 3⅝ inches.

blackish-brown, and longitudinally striped with the same color; tail, dark ash, crossed with eight bars of very pale rufous white; under surface lighter, but more distinctly striped and barred than the back; wings, brown, with bars of pale rufous and grey; legs, greyish-white, with pale rufous bars; bill, dark horn color at the base, and white at the end; an orange-colored spot on the under part of the lower mandible near the tip; ruff, whitish, with dark brown tips; under tail coverts greyish-white, striped and barred with pale brown; claws, horn color, lighter at the base.

Total length of skin, 9 inches; wing from flexure, 6½ inches; tarsus, 1¼ inch; tail, 3¼ inches.

Habitat.—California; procured near Sacramento by E. S. Holden, Esq.

2. PUFFINUS ——? *Procellaria hæsitata* Kuhl. Gould B. of Austr. vii. pl. 47.

The specimen of *Puffinus* herein described is precisely like one in the collection of the Acad. of Nat. Science, Phil., which is said to be the original bird described and figured by Gould in his Birds of Australia, referred to at the head of this article.

In the Zoologist for Dec., 1852, an account is given of the capture of a Petrel in England, which, upon investigation, was decided to be the *Proc. hæsitata* of Kuhl, and different from the bird so named by Temminck, of which a figure is given in the Planches coloriées, pl. 416.

It is stated in the Zoologist, that four different species of Petrels have been named *Proc. hæsitata* by different authors, for a full explanation of which, see the article alluded to.

My specimen does not resemble the *Proc. hæsitata* Kuhl, as established in the Zoologist, nor the one figured by Temm. under the same name; besides, it is generically different, being a *Puffinus.*

Mr. Gould states in his description, that it is very similar to *P. cinereus* Gmelin, to which species Mr. Gould's bird is also referred by the writer in the Zoologist; it may possibly be so, but Gmelin's description applies better to our Common Shearwater, which has generally been considered the same as his species, but is now acknowledged to be *Puffinus major* Faber.

Until further opportunities for investigation offer, I think its identification with Gould's bird is sufficient for its introduction into our Fauna.

Upper plumage bluish-ash or pale plumbeous, with a silvery gloss, darker on the head, where the feathers are short and satiny; sides of the head, of the same color, which also extends on the neck in front, where it becomes paler; wing coverts dark bluish-ash, broadly margined with chocolate brown; primaries, greyish black on the outer webs and ends of the inner, rest of the inner webs, light brownish-ash, becoming whitish at the base; secondaries, chocolate-brown; tertiaries, brownish-ash; inner lining of wings and axillars, brown; tail, brownish-black and graduated, the two central feathers, obtusely pointed; under plumage, white; upper and under tail coverts, ashy-brown; upper mandible, black along the ridge; the sides and hooked tip, yellowish white; under mandible, dusky yellow, with the lateral grooves black, and the cutting edges white;

black, most conspicuous on the upper part of the back; smaller wing coverts black, tipped with brown; larger wing coverts white, margined and tipped with black; primaries, black on the outer webs, and white on the inner to near the end, where they are brown; secondaries white, lightly tipped with black; tail, white, with a terminal band of black; under tail coverts white, sparingly marked with blackish-grey; under plumage, white; bill, black; legs and feet, brown, with some orange-colored markings on the toes.

Most of the black markings in the plumage have a plumbeous hue.

Length of skin, 15 inches; wing from flexure, 10¾ inches; bill, 1⅝ inch; tarsus, 1⅝ inch; tail, 4½ inches.

From the coast of California, opposite Monterey. Cabinet of N. Pike, Esq.

III.—*Ornithological Notes. No. 2.*

By Geo. N. Lawrence. *Read March* 28, 1853.

1. Stercorarius catarractes (Linn.). Entire upper plumage, dark umber-brown, with the shafts and tips of many of the feathers greyish-white; wings, deep chocolate-brown, darker on the outer webs of the primaries; these have the basal half white; most extensive on the inner webs; the shafts are white; the tail is dark chocolate-brown, with the shafts white at the base; under plumage dull ferruginous-brown, lighter than the back; feathers of the neck, yellowish-white along the shafts; bill, black; legs and feet, black.

The tail is rounded, and consists of twelve feathers, the two central somewhat lengthened.

In form very strong and heavy.

Length of skin, 22 inches; wing from flexure, 15 inches; bill along ridge, 2½ inches; tarsus, 2¾ inches; middle toe and nail, 3½ inches; outer, 2¾ inches; inner, 2¼ inches; tail, 5¾ inches.

Obtained near the coast of California, in the latitude of Monterey.

From the cabinet of Nicolas Pike, Esq.

Some writers have considered this species North American, but I can find no account of its having been heretofore either observed or obtained within our limits.

2. SYLVICOLA PENSILIS (Gmel.). A fine male of this Southern species was obtained on Long Island last summer—others were seen in company with it.

It has seldom been noticed further north than Carolina.

3. BUTEO PENNSYLVANICUS (Wilson). As I can find no correct description given of this Hawk in its fully adult state, and differing, as it does, so materially from the young, in which plumage it is usually obtained, I have thought best to describe it:—

under surface very closely covered with dark ferruginous spots, much more abundant than in the male specimen.

In the young, the upper plumage is dark umber-brown, edged with ferruginous; the under yellowish-white, marked with longitudinal brown spots.

I have received from Capt. J. P. McCown the subjoined notes, made by him while in Texas, giving the habits of some of the birds found there. As they possess much interest in serving to elucidate the histories of many species of which we possess little knowledge, I have offered them for publication in connexion with the above.

Facts and Observations from Notes taken when in Texas.

By Capt. J. P. McCown, U. S. A.

Conirostrum ornatum Lawrence. In my wandering in Texas, I observed this little bird several times, and always in the thick chaparral and cane-brakes in the vicinity of water. Allowed me to approach near it; seemed silent and restless.

Embernagra rufivirgata Lawrence. Uncommon. I am uncertain whether I saw other than the specimen procured.

Icterus cucullatus (Swain). Common on the Rio Grande. Shy in the woods, yet they seemed familiar when in our camp,, where we often saw them.

Callipepla squamata (Vigors). I often saw this beautiful Partridge in Texas, and always in the chaparral. I don't think it often, if ever, ventures into open fields or prairies.

They are exceedingly difficult to shoot, as they are apt to run from a dog, and once flushed, are seldom found a second time the same day. Their call or whistle is quite different from the common quail, resembling more the cackling of a very young pullet, and yet something that of a guinea-hen. This call I have heard in the courting-season, when I have seen the cock strutting upon the tops of cactus clusters, after the manner of a turkey, only I have never seen it elevate its tail. Whether this call is the usual one of the bird, or merely some courting-calls, I am unable to say. I never met with this bird below where the gravel ridges are found, nor much above Ringgold. I judged from what I saw *and did not see*, that they were pretty much confined to that particular locality.

CYRTONYX MASSENA (Less.). I first saw this gaudy bird on the mountains, near Saltillo, during the Mexican war. I procured some live specimens, and put them in a cage. In the mountains they are exceedingly gentle—almost simple—but when caged, are very wild, and generally injured themselves in their endeavors to escape. When flushed, they only go a few yards and drop, and I believe they hide under rocks and in holes.

passing between the skin and the neck down to the breast and back again, and then down to the lungs.

There is found under the feathers of the Chiac-ka-laca a fly, about the size of a common house fly, but very flat. This fly is exceedingly annoying, for as soon as you commence handling the bird they leave it, and are just as likely to get into the hair of your head or down your neck as to return to the bird or seek a new abode with some living individual of the chiac-ka-laka tribe. This fly is so hard that I could with difficulty kill it between my thumb and forefinger.

CHAPARRAL COCK, the Mexican Paisano, *Geococcyx viaticus* of Wagler. Often in my wanderings through the chaparrals on the Rio Grande, I observed piles of broken snail shells, and always near some hard substance, such as a bone or hard piece of wood, which had evidently been used in breaking the shells. I made many conjectures as to the probable animal. I never suspected a bird, that had left these evidences of their peculiar habits. I heard at times—generally in the morning or evening—a sound very similar to that made by some woodpeckers by a rapid beating of their bill upon an old dry tree. This was also a mystery, as I could find no woodpeckers near the place the sound came from. Upon inquiry of a Mexican, I was told that it was the Paisano breaking the snail shells to get at the snail, which explained at once to me both the noise, as well as the shells. I was afterwards so fortunate as to see a bird so occupied. It took the snail in its bill, and beat it upon the hard substance, striking faster and faster, until the shell broke. This also explains the use of their large and strong bill.

A few of these birds are to be found on the Rio Nueces. They run with great speed, seldom taking to wing. I have seen them on trees, apparently observing their vicinity. I had a young one, about half grown. It refused to eat, and died. I have seen some in coops, but never saw them feed, and doubt if they do in confinement, though I have been informed that they have been tamed (caged). When approached, they run with great speed, until near cover, when they stop and reconnoitre the intruder, gives its tail a flirt, and away it goes again.

I saw in 1846, on the mountains between Monterey and Saltillo, a pair of birds much like these, but much smaller. I observed them for some time, and feel satisfied that they were another bird. The snail, that seems to form their principal food, is found sticking to almost every bush, and often literally covered with them. Their stomach is made for digesting only soft substances (I had a drawing of one—I believe I gave it to you).

PYROCEPHALUS CORONATUS (Gmel.) This beautiful little fly-catcher is seldom seen. I did not see over a dozen of them while in Western Texas. I always found them near the ponds along the Rio Grande, and generally on a tree or stake over the water. The only nest I ever found was built upon a retama (a variety of the acacia) over the water. I was not able to get at the nest. The female is quite a plain bird.

QUISCALUS MACROURUS (Swain). This magnificent speci-

They have a peculiar cry, something like tearing the dry husk from an ear of corn. From this, the soldiers called them "corn huskers."

I often saw other and smaller birds building on the same tree with them. They are quite familiar. I have had them come within ten feet of me.

Turdus solitarius (Wilson). Abundant on the San Antonio river—uncommon further south. I saw none on the Rio Grande.

Athene hypugœa (Bon.) Burrowing Owl. Abundant on the Rio Grande.

Milvulus forficatus (Gm.) Swallow-tailed Fly-catcher. Abundant in South Western Texas; seemed to prefer the high dry hills, though seen often among the timber. I found them on the prairies, at least twenty miles from water, perched upon some tall weed or dead bush.

Cyanocorax luxuosus (Lesson.) Abundant on the Lower Rio Grande—uncommon above Ringgold Barracks. I saw several of their nests; all high, and difficult to get at. Very courageous.

Columba flavirostris Wagler. Not uncommon on the Rio Grande. In 1846 I saw many of them on the Alamo (in Mexico). Seem to prefer thick wooded country, and near streams of running water. Often to be seen perched upon high dead trees, giving forth their mournful notes.

Columba leucoptera Linn., White-winged Dove. Abundant on the Rio Grande. Finds abundant food from the musquite and ebony bean. Its habits are much like the Turtle Dove.

Macroramphus scolopaceus (Say) Lawrence. Uncommon—saw but few of them. Those seen were at a salt pond, called Aqua Nueva, in South Western Texas, at least one hundred miles from the coast.

Plectrophanes McCownii Lawrence. Procured two specimens on the Texas prairies. I fired at a flock of Shore Larks, and found this bird among the killed. The Shore Larks rose several times, and settled again before I fired.

Tyrannula cinerascens Lawrence, Ash-colored Fly-catcher. The only specimen procured was killed between San Antonio and the Rio Grande, near a small water course.

IV.—*Descriptions of New Species of* HELICIDÆ.

lower half of the last whorl; covered with a thin yellowish or brownish epidermis; spire conical, rather obtuse; whorls five, somewhat convex, the last equalling $\frac{3}{5}$ of the total length; columella with a strong oblique fold, which is so sharply defined on its upper side as to form a distinct canal; aperture oval-oblong; peristome reflected, reddish purple.

Length, 1.55 inch (40 millim.). Breadth, 0.82 inch (22 millim.).

Length of aperture within, 0.90 inch (23 millim.). Breadth of do. 0.45 inch (12 millim.).

A smaller variety occurs more rarely, in which the epidermis is of darker color, and the spots are sometimes entirely wanting.

Habitat.—District of San Fernando, in the island of Trinidad, 400 feet above the sea, where it was found by Mr. MacMurray—on the ground in woods among moist vegetation, on rich yellow spongy soil, not rocky. One example was also found in the neighborhood of the penal settlement, situate at the junction of the Massaroony and Essequibo rivers, Demerara, during Mr. MacMurray's visit to that place.

Remarks.—Belongs to the group of which *B. pudicus*, *B. auris-sileni*, *B. malleatus*, *B. fulguratus* are representatives, and for which Guilding proposed *Plekocheilus* as a subgeneric title. It also somewhat resembles *B. pulicarius* Gray, in form and coloration, but differs in sculpture and in the character of the columellar plait, and cannot easily be confounded with that or any other known species.

2. Bulimus Siamensis.

Testâ sinistrorsâ, rimato-perforatâ, ventricoso-conicâ; tenui, obliquè minutè striatâ, corneâ; spirâ conicâ, subacutâ; anfractibus 7, convex-

iusculis, ultimo spirâ breviori, subcarinato; aperturâ quadratâ; peristomate simplici, revoluto-expanso, albo; marginibus approximatis, columellari dilatato.

Shell sinistral, perforate, ventricose-conic, with fine oblique incremental striæ, horn-colored; spire conical, somewhat acute; whorls seven, rather convex, the last shorter than the spire and obtusely keeled; aperture subquadrate; peristome simple, revolutely expanded, white; margins approximated; columellar margin dilated.

Length, 0.75 inch (19 millim.). Breadth, 0.40 inch (10 millim.).

Aperture within, 0.24 inch (6 millim.) long, and 0.18 inch (4½ millim.) broad.

Habitat.—Siam.

Remarks.—I am indebted to Dr. T. R. Ingalls of Greenwich, N. Y., for this interesting species. It is allied to *B. venerabilis* Parreyss, from Transylvania, but is much more ventricose, and differs in having the last whorl keeled, a little after the manner yellowish brown spots above and lines beneath; spire obtuse; whorls 7½; very slightly convex, last one obtusely carinated, not deflected, convex beneath; umbilicus moderate; aperture lunar, strengthened within by a sharp but strong white lamella which revolves beneath the periphery, and is plainly visible through the substance of the shell, throughout the last whorl; columella very oblique, thickened into a callus which extends inwardly around the umbilical portion of the shell; lip simple, acute.

Greater diameter 0.42 inch (11 millim.). Lesser do. 0.39 inch (10 millim.).

Height 0.24 inch (6 millim.).

Habitat.—Bermuda, where it is rarely found under stones in plantations on the hill near St. George's, in company with *Helix microdonta* Desh., *Bulimus ventrosus* Fer.,* *Helicina* ———, and *Succinea* ———. It has been collected by our associates, Mr. T. Bland and Mr. T. Prime, by Mr. Robert Swift of St. Thomas —and also by the late Prof. Adams.

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* The occurrence of *Bulimus ventrosus* Fer. at Bermuda, has, we believe, not been before noticed, and is an interesting fact as exhibiting an area of habitat very unusual in a terrestrial species. Its occurrence is now authenticated at the following points:—Southern France, *Draparnaud*, *Lamarck*, and others; Italy, *Lamarck*; Southern Greece, *Deshayes*; Portugal, *Morelet*; Barbary, *Terver*; Madeira, *Lowe*; Canary Islands and Azores, *Orbigny*, *Webb* and *Berthelot*; Bermudas, *Swift*, *Bland*, *Prime*, and *Adams*. This general *insular* distribution is peculiarly remarkable, and it seems difficult to account for this exception to a well known law, except by bringing in the aid of human agency. The early colonization of the Madeiras and Canary Islands by the Portuguese, could easily occasion the accidental introduction of small European species of terrestrial shells —and we accordingly find other instances of a similar kind in the fauna of those islands. This might also happen in the Azores, distant as they are; but in the case of the Bermudas, this probability is much lessened by the fact of their colonization, trade, and communication having been mostly confined to Great Britain, where this species does not exist.

Remarks.—In form, this species approaches *Helix cinctella* Drap. from Europe, and *H. Rawsonis* Pfr. from Mauritius, but its other characteristics refer it to the lamellated group of which *H. pila* Ad. is a representative, and which Beck in 1837 proposed to elevate to a subgenus under the name of SAGDA.

V.—*Descriptions of New Species of* ACHATINELLA *from Sandwich Islands.*

By DR. W. NEWCOMB, *of Honolulu, Corresponding Member.*

Read February 12, 1858.

1. Achatinella violacea.

Testâ dextrorsâ, ovato-oblongâ, solidâ, longitudinaliter valdè striatâ, violaceâ, striis pallidis variâ; anfractibus septem, convexis; suturâ sim-

2. **Achatinella tessellata.**

Testâ sinistrorsâ, ovato-oblongâ, solidâ, minutissimè decussatâ, albido-flavescente, plerumque vittis transversis nigris vel castaneis diversè pictâ; anfractibus convexis, ultimo paulùm inflato, superioribus nigro et albido semper tessellatis; aperturâ albâ vel roseâ, ovatâ, infrà effusâ; columellâ brevi et latè callosâ; labio columellari lato, subreflexo.

Shell sinistral, ovate-ôblong, solid, with minute decussating striæ, color white or fawn-colored, variously striped or not with black or chestnut bands, upper whorls always tessellated with black and white; whorls convex, the last somewhat inflated; aperture white or roseate, ovate, effuse below; columella short and broadly callous; columellar lip broad and slightly reflected. Length 1 to 1.1 inch. Breadth 0.6 inch.

Animal.—Body light grey, mantle slate color.

Habitat.—Molokai.

Remarks.—This shell in form and general appearance approaches *A. virgulata* Mighels, but may be readily distinguished at any period of its growth by the tessellations on the upper whorls, by its more robust form, and by differences in the animal.

3. **Achatinella Adamsi.**

Testâ dextrorsâ, conicâ, acuminatâ, transversim exilè et longitudinaliter rugulosè striatâ, fusco-castaneâ irregulariter albido punctatâ et strigatâ; suturâ valdè impressâ; anfractibus sex, ultimo infrà medium fasciâ albâ interruptâ; aperturâ plumbeâ; columellâ in plicam solidam, abruptè tortam desinente; labio simplici.

Shell dextral, conically acuminate, finely striated transversely, roughly striate longitudinally; whorls six; suture deeply impressed; columella terminating in a strong abruptly twisted plait; lip simple, interior of shell of a leaden blue color; exterior dark chestnut, irregularly mottled and striped with white, with an interrupted white band encircling the lower half of the body whirl.

Length 0.9 inch. Breadth 0.5 inch.

Habitat.—Makawao, Maui.

Remarks.—Allied to *A. perdix* Reeve, but differs in marking.

4. Achatinella splendida.

Testâ sinistrorsâ, ovato-acuminatâ, solidâ, striis exilibus decussatâ, albâ, lineis multis vittisque transversalibus castaneis ornatâ; linearum et vittarum margine superiore integro, inferiori irregulariter serrato; suturâ modicè impressâ, marginatâ; anfractibus sex, duobus superioribus albido et castaneo tessellatis, ultimo sub-inflato; aperturâ ovatâ; columellâ brevi, latâ et contortâ; labio expanso.

5. Achatinella Gouldi.

Testâ dextrorsâ, ovato-conicâ, longitudinaliter striatâ, albido-luteolâ; suturâ subimpressâ, haud vel levissimè marginatâ; anfractibus sex, plano-convexis, tertio lineis brevibus fuscis, formæ zic-zac notato, inferioribus tribus lineolis variis fuscis cinctis; aperturâ rotundo-ovato, flavescente; columellâ subcallosâ; labio expanso et infernè reflexo.

Shell dextral, conically ovate, longitudinally striate; suture moderate, not margined, or but slightly so; whorls six, flatly convex. Color yellowish-white, with zig-zag lines of brown on the third whorl, and brown lineations more or less numerous encircling the three lower whorls; aperture rounded-ovate, yellowish; columella lightly callous; lip expanded and below reflected.

Length 0.85. Breadth 0.45 inch.

Habitat.—On Tutui trees, Wailuku valley, Maui.

6. Achatinella rufa.

Testâ sinistrorsâ, conico-ovatâ, solidâ, striis decussatâ, fusco-rubrâ, epidermide fusco, albo-permixto indutâ; suturâ simplici, subimpressâ; anfractibus sex, plano-convexis; anfr. superioribus epidermidis lineolis albis in zic-zac dispositis, quæ in ultimo anfr. in fusco-cinereo concolore evanescunt; anfr. ultimo, infrà medium albo-zonatâ; aperturâ fusco-rubrâ; columellâ valdè callosâ; umbilico exiguo aperto; labio expanso, infernè reflexo.

Shell sinistral, conically ovate, solid, with decussating striæ; ground color externally and internally brownish red, covered with an epidermis of a mottled brown and white, the latter arranged on the central whorls in fine zig-zag markings, which are lost on the last whorl in a uniform greyish umber; lower half of this whorl encircled by a broad white band;

whorls six, flatly convex; suture plain, moderately impressed; columella strongly callous; umbilicus open, small; lip expanded, reflected below.

Length 0.9 inch. Breadth 0.5 inch.

Habitat.—Molokai.

7. Achatinella Redfieldi.

Testâ sinistrorsâ, elongatâ, conicâ, longitudinaliter striatâ; colore albido-flavo, infernè in castaneum fuscum transiente, fasciâ albâ suturali, interdum fasciis fuscis, obscurè undulatis in tertio solùm anfractu; anfractibus sex; suturâ impressâ, marginatâ; aperturâ subovatâ; columellâ fuscâ, planâ et contortâ; labio subreflexo, fusco.

Shell sinistral, elongate, conical, striated longitudinally. Color light fawn passing into deep chestnut, paler above, plain or with transverse chestnut bands with obscure undulations upon the third whorl only; a white band also traverses the suture. Whorls six; suture well impressed, slightly margined: aperture

Shell dextral, elongate ovate, polished, finely striated longitudinally. Color light flesh-colored above, two last whirls white obscurely banded with light brown: whorls six, convex; suture slightly impressed, margined: aperture subovate; columella twisted into a plait, slightly callous: lip slightly reflected, dark brown.

Length 0.9 inch. Breadth 0.45 inch.

Variety α. Shell white, bluish white above, without coloring or bands.

Habitat.—Waiauai, Oahu.

9. Achatinella dubia.

Testâ dextrorsâ, conico-elongatâ, tenui, minutè decussatim striatâ, pallido-corneâ, lineis zic-zac et maculis pallidis notatâ; anfractibus sex; suturâ simplici; aperturâ ovatâ; columellâ albâ, in testis junioribus bulimoideâ, in adultis callo conspicuo præditâ; umbilico pervio, parvo; labio incrassato, subflexo.

Shell dextral, conically elongate, thin, finely decussately striated, light corneous with radiating zig-zag lines and blotches of a light color; whorls six; suture simple: aperture ovate; columella white and bulimoid except in strongly developed adults, where it is callous and obtusely dentated: umbilicus small but pervious; lip thickened, slightly reflected.

Length 0.8 inch. Breadth 0.55 inch.

Habitat.—Oahu, among stones.

Remarks.—This shell may perhaps be identical with *A. radiata* Gould, which from its ambiguous generic character, Pfeiffer transferred to *Bulimus*, changing its specific name to *Gouldi*—to avoid confusion with *B. radiatus* Brug. Our shell here occupies its true generic position, unless we call it a *Bulimus* in its immature state and *Achatinella* only when fully developed. If retained in genus *Achatinella* and if its identity with Gould's shell should be established, Gould's name will take precedence, notwithstanding its use by Pfeiffer for a different shell. Pfeiffer's *A. radiata* was published six months after Gould's, and moreover it proved to be identical with *A. viridans* Mighels (not Reeve.)

10. **Achatinella polita.**

Testâ dextrorsâ, conico-ovatâ, nitidâ, luteolâ, supernè fusco obscurè notatâ, fasciâ suturali latâ, nigrâ in ultimo anfr. protractâ; anfractibus quinque, convexis; suturâ distinctâ, marginatâ; aperturâ oblongo-ovatâ, purpureâ; columellâ valdè tuberculatâ, extremitate purpureâ; labio simplici.

Shell dextral, conic-ovate, polished, light yellow, a portion of the upper whorls faintly marked with umber, suture with a broad black band, and a narrow line of the same color continued around the body whorl: whorls five, convex: suture

castaneo-fuscâ indutâ; anfractibus quinque, ventricosis; apice acutâ; suturâ simplici, distinctâ; aperturâ ovatâ, albâ; columellâ in plicâ forti albâ desinente; labio intùs incrassato, simplici.

Shell dextral, depressed-conical, inflated, solid, striated, covered with an epidermis of dark umber color; whorls five, rounded; apex acute; suture simple, well marked; aperture ovate, white; columella with a strong white plait; lip thickened within, simple.

Length 0.4 inch. Breadth 0.35 inch.

Habitat.—Hale-a-ka-la, Maui, among decaying leaves.

12. Achatinella Cumingi.

Testâ sinistrorsâ, acuminatâ, turriformi, striis numerosis fortibus obliquis et longitudinalibus exilioribus decussatâ; fuscâ, supernè albo-undulatâ; anfractibus quinque, plano-convexis; suturâ subimpressâ, marginatâ; aperturâ oblongo-ovatâ; columellâ sub-callosâ; labio tenui, elliptico.

Shell sinistral, acuminate, turreted, with strongly marked transversely oblique striæ, and with longitudinal incremental striæ more or less developed; color brown with undulations of white on the upper whorls; whorls five, flatly convex; suture moderately impressed, margined; aperture oblong-ovate; columella slightly callous; outer lip thin, elliptical.

Length 0.7 inch. Breadth 0.2 inch.

Habitat.—Hale-a-ka-la, Maui.

13. Achatinella Pfeifferi.

Testâ sinistrorsâ, acuminatâ, turriformi, longitudinaliter profundè sulcatâ, striis transversis distinctis decussatâ, tuberculatâ, et in areis irregu-

laribus dissectâ, fuscâ, supernè lineis albis longitudinalibus notatâ; anfractibus sex, plano-convexis; suturâ profundâ; aperturâ oblongo-ovatâ: columellâ simplici, planâ; labio simplici.

Shell sinistral, acuminate, turreted, with the surface irregularly cut up into furrows, ridges, and tubercles by deep longitudinal sulcations crossed by strongly developed transverse striæ; color brown, with white longitudinal lines on the upper whorls; whorls six, flatly convex; suture deep; aperture oblong-ovate; columella plain and smooth; outer lip simple.

Length 0.65 inch. Breadth 0.25 inch.

Habitat.—Molokai.

Remarks.—The last two species, together with the *A. plicata* Mighels, form a group peculiarly interesting; deviating from the typical forms sufficiently to warrant a separation from the genus *Achatinella.* Should the number of species be multiplied they may with propriety be erected into a distinct genus.

15. Achatinella Helena.

Testâ sinistrorsâ, ovato-conicâ, striis exilè decussatâ, rufâ, lineis zic-zac albis, latis, longitudinalibus alternante, interdum anfractu ultimo albo-fasciato; anfractibus quinque, ventricosis; suturâ profundâ, simplici; aperturâ ovatâ; columellâ sub-callosâ.

Shell sinistral, ovate-conical, with finely decussating striæ, rufous, alternating with broad longitudinal zig-zag white lines covering the entire shell; the last whirl often encircled by a white band; whorls five, rounded; suture deep, simple: aperture ovate, columella slightly callous.

Length 0.5 inch. Breadth 0.22 inch.

Habitat.—Molokai.

Remarks.—This beautiful shell is dedicated to the lady who delineated the species herein described, and prepared them for publication.

16. Achatinella labiata.

Testâ dextrorsâ, elongatâ, subovatâ, plumbeâ; anfractibus septem, planis, tertio angustiori, pallidiori, ultimo fasciâ albâ suturali; suturâ submarginatâ; aperturâ elongato-ovatâ; columellâ brevi, in dentem prominentem, plicatum desinente; labio incrassato, albido, callo interno centrali munito.

Shell dextral, elongate-ovoid, plumbeous except the third whorl, the margin of the outer lip, and along the suture of the last whorl, which are white; whorls seven, flattened; the third narrower than the second: suture slightly margined below; aperture elongate-ovate: columella short, with a strong, plaited projecting tooth; lip thickened, white, with a central internal callosity.

Length 0.5 inch. Breadth 0.21 inch.

Habitat.—Oahu.

17. **Achatinella mucronata.**

Testâ dextrorsâ, elongato-ovatâ, albidâ, signis mucronatis numerosis fuscis ornatâ; anfractibus sex, ventricosis; ultimo contracto, epidermide denso fusco-nigro induto; suturâ supernè subimpressâ, infernè profundâ; aperturâ parvâ, ovatâ; columellâ contortâ, plicatâ; labio simplici.

Shell dextral, elongate-ovate, white with numerous transverse arrow-headed brown markings, except last whorl which is covered with a dense brownish-black epidermis; whorls six, rounded, the last contracted; suture slightly impressed in the upper portion, becoming deep at the junction of the last whorl; aperture small, ovate; columella with a twisted plait; lip simple.

Length 0.7 inch. Breadth 0.32 inch.

Habitat.—Molokai.

Remarks.—The *A. rubens* Gould is the nearest allied species.

18. **Achatinella fusca.**

19. **Achatinella lineolata.**

Testâ dextrorsâ, elongatâ, turriformi, nitidâ, epidermide luteolâ; anfractibus sex, ventricosis, ultimo lineolis longitudinalibus zic-zac brevibus castaneo-fuscis confertè signato; suturâ simplici; aperturâ ovatâ; columellâ dente obliquo, plicato instructâ.

Shell dextral, elongate-turreted, shining, covered with a yellowish epidermis; whorls six, ventricose, last one thickly marked with longitudinal umber-colored zig-zag lines; suture simple; aperture ovate; columella with an oblique, plaited tooth.

Length 0.5 inch. Breadth 0.22 inch.

Habitat.—Maui.

20. **Achatinella nitida.**

Testâ dextrorsâ, ovato-conicâ, tenui, pellucidâ, nitidâ subcorneâ; fasciolâ rufâ lineari suturali obscurè circumdatâ; anfractibus sex, ventricosis; suturâ marginatâ; aperturâ ovatâ; columellâ in pliculam contortam, albidam desinente; labio tenui.

Shell dextral, ovately conical, thin, pellucid, shining, light corneous, with a faint linear band of red beneath the suture; whorls six, ventricose; suture margined; aperture ovate; columella terminating in a twisted oblique white plait; lip thin.

Length 0.4 inch. Breadth 0.11 inch.

Habitat.—E. Maui.

21. **Achatinella grana.**

Testâ dextrorsâ, ovato-conicâ, solidâ, corneâ; anfractibus sex, submarginatis; aperturâ ovatâ; columellâ dente plicatâ albidâ instructâ; labio subincrassato, albo; labio interiori expanso et arctè appresso.

Shell dextral, ovate-conic, solid, corneous; whorls six, faintly margined; aperture ovate; columella with a strong plaited tooth; outer lip slightly thickened, white; columellar lip expanded and applied to the body whorl.

Length 0.3 inch. Breadth 0.1 inch.

Habitat.—E. Maui.

VI.—*Note to the "Description of the* SELENE ARGENTEA *of Lacépède;" at Vol.* V. p. 68 *of these Annals.*

By T CARSON BREVOORT.

Read May 23d, 1853.

Since the above paper was published I have met with two highly interesting notices of this once doubtful species of fish. The first is a description only, but taken from nature, by *Dr. Johann David Schöpf*, a military physician who accompanied

Freunde zu Berlin;" (being the same as the second volume of that portion of the series which is entitled *Beobachtungen*, &c.,) third part, Berlin, 1788; pages 138–194. This memoir was unknown to Dr. Samuel Mitchill, but is alluded to by Dr. Dekay.

At page 146, after the name *Cottus grunniens*, L., follows an article which might be supposed to refer to that fish, but which in fact is a description of the *Selene argentea*, then unknown to naturalists, and which received no specific name from the modest *Schöpf*, who however was aware that he was describing a new species. A note is appended to the article by the ichthyologist *Bloch*, to whom the memoir appears to have been referred, as he has also added notes to several other descriptions. Bloch says, "*I take it to be the Vomer of Linnœus*," &c. Schöpf, however, never describes fish which had been noticed by the great Swede, but merely quotes their names. I have carefully translated his description.

"Head and body compressed laterally, and nearly all over of a brilliant silvery colour. No spines at the vent. The forward portion of the lateral line describes a half circle, the rest runs out straight. The spine on the back is straight. The first dorsal has 6, the second 9.23 rays; of this one the second ray is prolonged beyond the others, and equals the length (from mouth to tail) of the whole body. The pectorals have 17 or 18; the ventrals 5; the anal 1.20 (the second is the longest); the caudal 24 rays."

"The numbers of all the fin rays agree nearly with those given by Linnæus for the *Zeus Vomer;* but the absence of spines near the vent and the LONG RAYS OF THE SECOND DORSAL AND ANAL FINS DISTINGUISH IT FROM THAT SPECIES.* It also differs from the *Zeus Gallus* as described by

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* "I take it to be the *Vomer* of Linnæus; in my 'Natural History of Foreign Fish,' 4to. 3d part, page 5145, I have remarked, that I could not find the spines mentioned by Linnæus.—BLOCH."

Linnæus in that the 8th, and not the 10th, is the longest ray (counting from the first) of the dorsals. The fish, with a length of from half a foot to a foot, is hardly an inch in thickness, and is easily dried. It is found only during the summer in the waters of New York; is not eaten, and has not yet received any distinctive name."

There can be no doubt here as to the species which was examined and described by Schöpf. His particular mention of the long rays of the *second* dorsal and *anal*, as distinguishing it from the *Zeus* or *argyreiosus Vomer*, which has them in the *first* dorsal, is alone enough to prove that he was not examining this last species. Indeed he does not appear to have met with the *A. Vomer* in our waters. As for the anal spines they are so hidden as easily to escape observation, though *Linnæus* had noticed them. They are present in all the allied genera. The numbers of the fin rays are almost precisely alike in *Selene* and *Argyreiosus*. *Schöpf* also gives but 6 rays to the first dorsal and 5 to the ventrals, whereas the first of these fins has 8 and the last 1.5 rays. His description is therefore the first one published of the *Selene*.

Lacépède was the second to notice and the first to figure it.

Agassiz says of Spix's specimens that "*several, of various sizes,*" are preserved at Münich. This would seem to indicate that the *Selene* and *A. vomer* are there confounded under this latter name. The little *A. vomer*, I believe, is never found over three inches long, while the *Selene* is usually double that length.

The following extract from Agassiz's description at page 109 of the work in question, will prove that he was describing the *Selene.* Among the generic characters of the species, he says: "*Pinnæ dorsales duæ; anterior radiis aculeatis gracilibus brevioribus paucioribus; posterior mollis longa,* RADIO TERTIO SIMPLICI MAXIME PRODUCTO. . . . PINNÆ VENTRALES MINIMÆ, ACUTISSIMÆ;" &c. Among the specific characters are the following: "*Pinnæ dorsales duæ; anterior minima aculeata, radio primo et posterioribus brevissimis; posterior mollis radiis pluribus ejusdem fere longitudinis* PRÆTER TERTIUM SIMPLICEM LONGISSIMUM, *qui reclinatus ultra pinnam caudalem extenditur, quartus et quintus sequentibus etiam longiores.* . . . PINNÆ VENTRALES RADIIS TENUISSIMIS, ACUMINATÆ;" &c. None of these characters are applicable to *Argyreiosus vomer* as described by previous authors and by Cuvier, but correspond accurately with *Schöpf's* description and *Plumier's* figure. As for the figure in this work, it appears to have been taken from a preserved specimen, for the body is not as high as it ought to be, the dorsal spines are too short, and the anal spines are wanting. The ventrals are represented as tapering to a fine point, which is not the case in the specimens which I have examined. Otherwise the figure is very accurate.

Now let the following comparison be instituted, and th ferences between *Selene argentea* and *A. vomer* will be e Compare *Lacépède's* figure in Tom. iv. pl. 9, fig. 2, *Spi Selecta Genera,* plate 58, and mine at plate 4, Vol. v Annals, all representing the *Selene,* with those of thors who have represented the *Argyreiosus vome Linnæus* in the *Museum Adolphi Friderici,* &c., tab.

Cuvier and Valenciennes, *Hist. des Poissons*, Vol. ix. fig. 255; *Mitchill*, *Trans. of the Lit. and Phil. Soc. of N. Y.*, pl. 2, figs. 1 and 2; Dekay, *Fish of N. Y.*, pl. 27, fig. 82, and pl. 75, fig. 238. These two last authors, under the names of *Zeus* or *Argyreiosus rostratus*, *capillaris*, and *vomer*, were probably describing one species, but I will not be positive that it is so. Our *Argyreiosus* appears to differ from the one found in Brazil and the West Indies, but a comparison of specimens can alone decide that question.

Schöpf, therefore, must have the credit of first describing the *Selene* as a new fish, and *Plumier* first figured it.

The list of synonyms will then stand as follows:

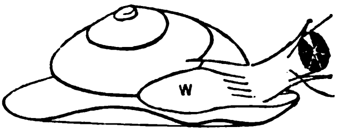
———— ——— (s. n.) Schöpf: Beob. der Ges. Nat. Forsch. Freunde; Tom. 2, pt. 3, p. 146.
***Selene* *argentea* Lacépède: Hist. Nat. des Poissons; 4to., Tom. 4, p. 562, pl. 9, fig. 2, (Plumier.)**
***Argyreiosus* *vomer* Agassiz; Selecta Genera, &c.; p. 109, pl. 58. (Spix.)**

light undertaking, though a very valuable one in its results, were it to be carefully studied and the species accurately defined.

VII.—*Observations on the Animal of* ROTELLA *Lam.*

Communicated to the late Prof. C. B. Adams, by the Rev. S. B. FAIRBANK, of Bombay, and read before the Lyceum, by T. Bland. February, 1853.

Since I wrote to you I have found Rotellæ alive in great numbers, and have had them displaying their curious bodies in plates of salt water. The structure of the animal is so curious that I have drawn a rough outline for you, much larger than life, for distinctness sake.



The animal is opakish white. The foot large and flexible, the edge often playing up against the shell. A lobe of the mantle (?) marked *w*, partly clings to the shell, but does not at all envelop it. The siphon mouth is very curious. This is a tube, the side being slit next the outer lip of the shell, and filled with cilia! The cilia are tipped with black. Sometimes they gather against the sides, so that you see a tube with a black rim, but usually they are disposed much as I have dotted them in the figure. One tentacle supporting an eye forms an edge of the slit of the siphon, and there is a filament-like tentacle near it, which roots inside the siphon. The other eye-bearing tentacle and its attendant filament are free their whole length.

I found these Rotellæ where the water would leave them dry at least two hours each tide,—just buried in the sand, and very abundant. There were several to a square inch, for several rods in extent. When I put them in water, they did not move about much,—only raised up their siphons. So I conclude that they feed on the minute living things brought to them by the water.

VIII.—*On the Homœomorphism of Mineral Species of the Trimetric System.*

By JAMES D. DANA, of New-Haven, Conn. Honorary Member.

Read March 13, 1854.

Although many cases of homœomorphism among minerals of the Trimetric System have been pointed out by different investigators, no general review of the species in this respect has yet been made. We propose, therefore, to consider the relations in form among all the species, believing that in this way, and in this way alone, we may arrive at the true system among the homologies, and the principles upon which they rest.

In the outset, it is important to ascertain what may be considered true criterions of homology in the comparison of forms. In a trimetric crystal there are often several occurring prisms in the three axial directions, the vertical, macrodiagonal, and brachydiagonal, and as either axis might be assumed to be the vertical axis, and either prism in each direction the fundamental prism,* there are wide limits as to the possible cases of homœomorphism that might be made out. So among rhombohedral forms, in Calcite for example, rhombohedrons occur of a great variety of angles, and homœomorphism may be deduced between it and almost any rhombohedral species, provided any one of these rhombohedrons may for the time be taken as fundamental.

There is obviously one right position for the comparison of two species, and the others are wrong. Hence it is essential to have some basis for deciding upon this point, and especially for ascertaining which is the true vertical axis, in order that we may compare like axes and their planes with one another.

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* A fundamental vertical prism is one which has for its axes b, c, the ratio $1b : 1c$. The fundamental macrodome and brachydome have the analogous ratios $1a : 1b$, and $1a : 1c$. These are the *unit* prisms.

It must be admitted that there are no tests of homology which are of invariable application. As elsewhere in science, the relations of species are to be ascertained rather by the general range of characters, than by the severe application of one single law. But there are important aids, and their exact value should be ascertained.

1. *Cleavage.*—Cleavage is one of the most important means. In the trimetric system, it may take place parallel, (1) to the axial sections, one or all; (2) to the lateral planes of different rhombic prisms; (3) to octahedral planes.

a. When cleavage is parallel to one or more rhombic prisms, it is generally true that, (1) the vertical axis of the prism of most perfect cleavage is the proper vertical axis of the species, and also that (2) these cleavage prisms for different species are homologous prisms.

Hornblende and Augite correspond to the *first* of the two principles just stated, but are well known exceptions to the *second:* the cleavage prism of one has twice the breadth of that of the other. These species, nevertheless, are closely homœomorphous, and hence there may still be an intimate relation when the cleavage forms have a simple axial ratio, as 1 : 2. Diaspore mer may become obsolete, while the latter is highly developed, or the reverse; and therefore *the presence or absence of a diagonal or basal cleavage is no test of identity.* The anhydrous sulphates are a prominent example. In *Celestine* and *Heavy Spar* a basal and prismatic cleavage exist, and the two diagonal cleavages are imperfect; while in *Anhydrite*, of the same group, the basal and diagonal are highly perfect, and no prismatic cleavage has been detected. In rhombohedral forms, a basal cleavage often occurs along with a rhombohedral, and in species actually homœomorphous, it may become the only cleavage, or be wholly obsolete. It is, however, often true, that a particular direction of cleavage characterizes a group of species. In the *Heulandite* group there is a perfect clinodiagonal cleavage; the *Feldspars* have a basal and clinodiagonal; the species of the *Calcite* series have a perfect rhombohedral cleavage, and no distinct basal, while the *Corundum* series have generally a basal cleavage, more distinct than the rhombohedral.

2. *Twin-composition.*—In compound crystals composition takes place in general, parallel to planes or sections of fundamental value. This is well seen in monometric forms, in which the only planes of composition are, (1) the faces of the cube; (2) the faces of the regular octahedron, or planes truncating the solid angles; (3) the faces of the dodecahedron, or planes truncating the edges of a cube. It will be observed that the composition is either at the extremities of the axes (1), or at points exactly intermediate between *three* axes (2), or between every *two* (3). This narrow limit to the possible directions of twin-composition gives importance to its indications, and therefore *similarity in modes of composition suggests identical or homologous relations between the planes of composition in different species, and vice versâ.* Thus when we observe different species, as *Aragonite*, *Cerusite*, etc., affording stellate twins and hexagonal forms by composition, parallel to the faces of a prism nearly 120° in angle, we infer that the prisms are homologous; and when similar prisms occur in *Chrysoberyl* or *Copper Glance*, we conclude that the prism

of 119° in these species, parallel to faces of which the composition takes place, is the true vertical prism, as in Aragonite. The fact that 120° × 3 or 60° × 6 equals 360°, is evidently the fundamental reason for the occurrence of such twins; and hence in other species a like angle for the vertical prism, especially if the prisms are alike in their other dimensions, would be likely to produce the same result.

Hence we conclude that the sulphates (RO, SO^3), although affording in one direction a prism near 120° in angle, have not this prism as the fundamental vertical prism, for stellate composition does not occur parallel to it; the true vertical prism is the one usually so assumed—that of 101° to 104°.

Bournonite affords another illustration of this subject. G. Rose has assumed its homœomorphism with Aragonite, on the ground that it has a vertical prism of 115° 58′. But this species, instead of forming twins parallel to the faces of this prism, actually affords cruciform twins parallel to a prism of 93° 40′, the one usually taken as the fundamental prism. The prism of 115° 58′ is $i\ \overline{\tfrac{3}{2}}$ ($\infty\ P\ \overline{\tfrac{3}{2}}$), and there is no reason for regarding it as other than a secondary prism.

Chrysoberyl has been placed near Chrysolite by the author,

3. *General Habit of Crystals.*—A resemblance in general habit is often to be detected between species related in crystallization. Thus Brookite, as figured in the American Journal of Science, vol. xvii., p. 86, resembles Columbite in the general arrangement of its planes; and we cannot mistake, in comparing them, as to the homologous prisms of the two. Again, it requires but a glance at the forms of Feldspar and Pyroxene to see that the habit here is wholly opposed to any homœomorphism between the species, while the family resemblance among the feldspars themselves is very striking.

4. *Frequency of Occurrence of Planes, or Zones of Planes.*—This criterion is sometimes of importance, and still it is very likely to lead astray. It is the common principle on which crystals are mathematically described, for that is usually assumed as the fundamental form which will give the simplest mathematical view of the crystallization. But it is well known that in many species *secondary* forms are most common. In Quartz, the fundamental form is rarely seen; in Calcite, the rhombohedron $-\frac{1}{2}R$ and scalenohedron R^3, are of far more frequent occurrence than R; in Fluor, cubes are more common than octahedrons, the cleavage form; and octahedrons, when they occur, often have their surfaces made up of the angles of minute cubes; and the same is true of many species. It is consequently no certain evidence, when a prism terminates in a pyramidal summit (as in Mesotype), that it is the unit pyramid, or even that the occurring prism in a species is one of the three unit prisms. It is natural to assume that an occurring zone of planes is one having the simplest ratios, and that among them exists one having the axial ratio of unity, $1a : 1b : 1c$. But this may be far otherwise. Anhydrite is a familiar example. The occurring prisms, according to the view of the author,* are $\frac{3}{8}\bar{i}$ ($\frac{3}{8}P\,\bar{\infty}$) and $\frac{8}{4}\breve{i}$ ($\frac{8}{4}P\,\breve{\infty}$), which bring out well the homœomorphism of

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* Amer. Jour. Science (2), xvii. 88.

the species with the other allied sulphates; but the three octahedral planes are then $\frac{3}{4}\breve{\frac{9}{8}}$, $\frac{6}{4}\breve{\frac{18}{8}}$, and $\frac{9}{4}\breve{\frac{27}{8}}$; and in any other view that recognises the homœomorphism, the expressions for the planes are scarcely less complex.

We cannot be too guarded, therefore, when deducing the form for comparison with another species, in relying on the prevalence of certain planes. Valuable hints are often thus given, but they may lead to error.

The lustre or smoothness of planes is a better guide, though far from certain. The fundamental vertical prism in Barytes is generally less highly polished than many other faces; and as we have above remarked, the octahedrons of Fluor have often rough surfaces.

The prevailing direction of the more extended zones of planes, especially the octahedral, often suggests rightly which is properly the terminal plane of the prism, these zones rising towards that plane; and they thereby afford a hint as to which is the vertical axis. In dimetric and hexagonal species, this criterion is a sure guide (except sometimes in hemihedral forms); but here it is not needed, as the basal plane is fixed from the nature of ing to homœomorphous comparisons, it is important that the special claims of each should be duly considered, instead of blindly adopting those which authors have found best to serve them in their mathematics.

5. *Analogies derived from Relations in Composition and Form.*—Similarity in chemical composition has long been known to suggest similarity in crystallization; and among species thus related it is usually safe to assume that prisms approximate in angle are homologous. Other more indirect analogies are often of weight, as illustrated in the case of Leadhillite, in a paper by the writer, on page 210, vol. xvii., of the American Journal of Science. We there see that the sulphates and sulphato-carbonates are parallel throughout in their homœomorphisms, and we ascertain with much probability which is the fundamental vertical prism in Leadhillite.

6. *Values and Relations of the Angles of Forms.*—In the series of prisms in each axial direction, the vertical, macrodiagonal, and brachydiagonal, the planes, as is well known, have simple axial ratios, and the more common ratios are 1 : 1, 1 : 2, 2 : 3. If but a single prism occur in either direction, it is easy to calculate the values of the angles of other prisms having the above mentioned relations. This gives a series of angles. If, then, two species correspond with one another nearly in one element of such a series, they are also related in others, and they are evidently related in form. From the exceptions to the several criterions mentioned, it is evident that the absolute relation of the axes may not in many cases be ascertainable. The vertical axis, for example, may be doubled in length without violating any principle that can be laid down; or it may be halved in the same way. But we may with certainty determine whether forms are related in the *series* of angles, and when so related, the species are in a correct sense homœomorphous. Augite and Hornblende may be regarded as differing in this way, as we can by no criterion decide that the lateral molecular axes of Hornblende and Augite are identical; we know that they are so relat-

ed that one form might be a secondary to the other, that the prism of Hornblende has its orthodiagonal twice that of Augite in length, and that the serial relation of the forms is such that they may be said to belong to one type. This point will be abundantly illustrated beyond. We observe that in all the comparisons made in the following tables, the only changes from the forms assumed by authors made on the above principles to exhibit the homœomorphism of species, are such as depend on the simple ratios, 1 : 2, 2 : 3, 3 : 2, 2 : 1. No torturing of the forms has been required by employing unusual or complex ratios, notwithstanding the hypothetical manner in which the received fundamental forms have been in many cases assumed.

The preceding are some of the methods that are of importance in determining the crystallographic homologies of species. It appears that the *first* point to be determined, is the true vertical axis of species under comparison; and this being ascertained, the *second* is to fix upon the fundamental or unit vertical prism, or that which shall give the relative values of the lateral axes; and *third*, we have to determine upon a unit dome, either a macrodome or brachydome in a trimetric species, or else the unit two lateral, while the vertical is at right angles to the lateral, from the nature of the form, these last may either intersect at right angles, corresponding to the form of a rectangular prism, or at oblique angles, corresponding to the angle of a rhombic prism; that is, in other words, they may connect the centres of the lateral faces of a rectangular prism or of a rhombic prism. Either condition will express the forces as indicated by the form, and result in the solids of the trimetric system. And when the cleavage prism is rhombic, there is better reason for regarding the lateral axes as oblique in their intersections, than rectangular. The subject of twin crystals affords evidence that this is not mere hypothesis;* and additional proof is shown beyond in the relations of the domes to the angles of the regular octahedron. And still another argument may be derived from the relations of the domes in angle to the vertical prism. If such views may be adopted, it must obviously be essential to correct comparisons of form between species, that the *vertical* axis should be determined on the best possible data.

The preceding remarks are offered as introductory to the following tables of the values of the axes and principal prisms in trimetric mineral species. I have endeavored to apply with fidelity the principles that have been briefly reviewed. The unit prisms, as has been stated, are not in all instances those assumed as such by other authors; and although they are in general well entitled to be so regarded, they are not all supposed to be the unit prisms, as has been explained by referring to Hornblende and Augite as examples. An exhibition of the mathematical relations of the forms is the main point in view. Whenever we have placed in the columns of unit prisms, angles usually regarded as those of other prisms, it is stated by a mention of the form to which they have been commonly referred. Thus, under Chrysolite, the prism taken as $1\bar{\imath}$ is $\frac{1}{2}\bar{\imath}$ of most writers, as mentioned. These forms, as observed, differ from the unit prisms, either by the ratio 1 : 2 or 2 : 3, ratios of the simplest kind.

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* See the author's Treatise on Mineralogy, 4th edit., now in press.

The trimetric species are naturally divided into *four* grand groups, differing in the angle of the unit vertical prism (angle $I : I$ of the tables, ∞ P : ∞ P of Naumann), as follows:—

1. Angle $I : I$ from 90½° to 95°.
2. Angle $I : I$ near 102°, or from 98° to 105°.
3. Angle $I : I$ near 110°.
4. Angle $I : I$ near 120°.

It will be shown that these specific values of the angle $I : I$ are dependent on a principle of the most fundamental character. The *third* Group may, however, belong with the *second*, as remarked upon beyond.

The angles mentioned in the table are the obtuse angle of the prism $I : I$ (column 1), and the summit angle of the unit macrodome and brachydome ($1\bar{\imath}$ and $1\breve{\imath}$ or P $\bar{\infty}$ and P $\breve{\infty}$).*

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* To avoid any ambiguity in the angles referred to in the following pages, and render the subject intelligible to those who may not be familiar with crystallo-

TABLE I.

Angle of Vertical Prism near 90°.

	Vertical Prism. $I : I$	Macrodome. 1ī : 1ī	Brachydome. 1ĭ : 1ĭ	Axes. $a : b : c$
I.				
Thomsonite, - -	90° 40′	108° 18′	108° 56′	0.72253 : 1 : 1.0117
Mesotype, - - -	91°	(2ī) 108° 46′	(2ĭ) 109° 42′	0.71644 : 1 : 1.0176
Harmotome, - -	91° 46′	108° 48′	110° 26′	0.71626 : 1 : 1.0312
Wöhlerite, - - -	90° 54′	108° 2′	108° 56′	0.7261 : 1 : 1.01583
Pyrolusite, - - -	93° 40′	104° 22′	(½ĭ) 107° 54′	0.77601 : 1 : 1.0661
Andalusite, - - -	90° 44′	109° 6′	109° 50′	0.71198 : 1 : 1.0129
Lievrite, - - - -	(⅔) 91° 32′	111° 14′	112° 40′	0.68429 : 1 : 1.0271
Staurotide, - - -	(½) 93° 8′	(½ī) 108° 12′	111° 10′	0.72388 : 1 : 1.05617
Wavellite, - - -	(½) 90° 34′	(2ī) 106° 14′	106° 46′	0.75047 : 1 : 1.0099
Olivenite, - - - **Libethenite,** - -	92° 30′	108° 28′	110° 50′	0.72034 : 1 : 1.0446
Caledonite, - - -	95°	(½ī) 105° 8′	(½ĭ) 109° 54′	0.76568 : 1 : 1.0913
Chondrodite, - -	94° 26′	(½ī) 106° 52′	(½ĭ) 111° 4′	0.74176 : 1 : 1.0805
Antimony Glance,	90° 45′	(⅔ī) 109° 26′	(⅔ĭ) 110° 8′	0.6901 : 1 : 1.0132
Do. do.	"	(1ī) 88°	(1ĭ) 88° 47′	1.0352 : 1 : 1.0132
Polycrase, - - -	95°	(1ī) 88° 30′	(1ī) 93° 53′	1.02655 : 1 : 1.0913
II.				
Epsomite, - - -	90° 34′	120° 4′	120° 33′	0.57657 : 1 : 1.01
Diaspore, - - - -	93° 52′	115° 16′	118° 42′	0.63398 : 1 : 1.0699
Göthite, - - - -	94° 52′	113° 6′	117° 30′	0.66063 : 1 : 1.0888
Polianite, - - - -	92° 52′	115° 26′	118°	0.6317 : 1 : 1.0513
Euchroite, - - -	92° 8′	117° 20′	119° 13′	0.6088 : 1 : 1.038
Topaz, - - - - -	(½) 93° 8′	(⅔ĭ) 115° 22′	(½ī) 118° 10′	0.63258 : 1 : 1.05617
Chrysolite, - - -	94° 3′	(½ī) 115° 36′	(½ĭ) 119° 12′	0.6297 : 1 : 1.0733
Triphyline, - - -	94°	(½ī) 118° 27′	(½ĭ) 121° 55′	0.59549 : 1 : 1.0724
Bournonite, - -	93° 40′	(⅔ī) 115°	(⅔ĭ) 118° 14′	0.63745 : 1 : 1.0662
Do. - - -	"	(1ī) 92° 34′	(1ĭ) 96° 12′	0.95618 : 1 : 1.0662
? Warwickite, - -	93°-94°			
? Lanthanite, -	93° 45′			

domes are therefore the *unit* domes. The planes 1 on the eight angles are planes of an octahedron, having for the axes *a*, *b*, *c*, the ratio $1a : 1b : 1c$; it is therefore the *unit* octahedron.

Taking axis $b = 1$, $c =$ tangent of half the angle $I : I$; and $a =$ cotangent of half the summit angle 1ī : 1ī. These two angles alone are a correct exhibition of the degree of homœomorphism between species; all other angles are dependent upon these, and therefore a long series, for the sake of comparison, although often given, is not necessary or even desirable.

As 1ī is the unit macrodome, so 2ī will be a macrodome with the vertical axis *twice* as long; ⅔ī, one *two thirds* as long; ½ī, one *half* as long; and so on. The first figure or letter in a symbol refers always to the vertical axis *a*, and the other to the longer or shorter lateral axis, according as it has over it the long or short mark, ˉ or ˘.

The preceding table is naturally subdivided into two sections:—

I. Species having the summit angles of the domes, near 109°.
II. Species having the summit angles of the domes, near 120°.

In the first of these groups there is a remarkable closeness of coincidence to the angle mentioned; and in the second, the variation from 120° in the brachydome is but small. The vertical axis typical of the groups differs therefore theoretically as $\sqrt{3} : \sqrt{2}$, which is nearly as 6 to 5.

In section I. the axes a, b, c, have nearly or typically the ratio $1 : \sqrt{2} : \sqrt{2}$. In Andalusite, the ratio is almost identical with this, and 109° 28′ is exactly a mean between 109° 6′ and 109° 50′, the angles given for the two domes.

In section II. the ratio of the axes approaches $1 : \sqrt{3} : \sqrt{3}$, which it is very closely in Epsomite, the domes of which are nearly 120°.

109° is approximately the angle of the regular octahedron, the faces of which solid incline to one another 109° 28′. More-

If, therefore, we compare the regular octahedron with the *rectangular* octahedron that would result from the united domes $2\bar{i}$ and $2\breve{i}$ in the species of section I., we find them nearly identical. We observe, further, the important fact, that *the axes of the regular octahedron correspond to diagonals between the apices of the basal angles of the rectangular octahedron.* But these axes in the latter solid cross at *oblique angles* equal to the angle of the rhombic prism I, instead of right angles; and they correspond to lines between the centres of opposite lateral faces of the rhombic prism, I, and not to those between the centres of its opposite lateral edges. In other words, these lines are not the *crystallographic* axes of the Trimetric system, but what the author has called the *crystallogenic* axes. This is one reason alluded to on a preceding page for believing that the crystallogenic axes are not necessarily the same lines with the crystallographic. The latter are lines assumed for the convenience of calculation.

If instead of the domes $1\breve{i}$ in section I., the species had afforded $\frac{3}{2}\breve{i}$ as common and dominant forms, and these were taken as the unit domes, then the unit octahedron, in place of the domes, would have the pyramidal angles near 109°, approaching those of the regular octahedron. Could we therefore assume this as the fundamental octahedron for the species, the derivation of the octahedron from the regular octahedron would be a change in the lengths only of the axes, and not in their angles of intersection. But this assumption would do violence to the facts. Still in Antimony Glance, we have an example probably of this form and mode of derivation; the dominant form is an octahedron, with the pyramidal angles 109° 16′ and 108° 10′, and basal 110° 58′. Bournonite and Polycrase may be other examples of a similar nature, though diverging more in their angles.

Although the two sections are strongly marked in the above table, still the species of one may be regarded as homœomorphous with those of the other. Thus Chrysolite of Group II., and Chondrodite of Group I., have been recognised by Scacchi as homœomorphous. So also Andalusite and Topaz are essentially homœomorphous, as well as similar in chemical formulas. In both of these cases, one of the species contains fluorine, and this is evidently the occasion of the wide divergence. Yet in one instance the fluorine species (chondrodite) belongs to section I., and in the other (topaz) to section II.

The table affords examples, also, of the principle stated in a preceding page, that homœomorphous species, while identical in the particular axis which is the vertical, may vary by a simple ratio (1 : 2 or 2 : 3) in the axes, and that they are to be recognised as species that belong to a specific system of ratios, rather than to definite and identical dimensions.

Andalusite, Staurotide, and Topaz, have this relation. The forms of these species may be referred to a similar type; yet we cannot affirm that the axes have the near identity presented in the table, rather than a multiple ratio of 1 : 2 in some of the axes; we only know that they pertain to a common series.

Staurotide alone offers a choice between three uncertainties. The occurring form is a prism of 129° 20′; and this is usually taken as the unit vertical prism. A prism with the longer lateral axis *half* as long, has the angle 93° 8′, and this approaches the prism of Andalusite; and as the frequency of occurrence

	a.	:	b	:	c
A.—Prism $I = 129° 20'$; $1\bar{i} = 69° 16'$; $\frac{3}{2}i$ (one face of composition) $= 88° 24'$; $\frac{3}{2}\breve{\frac{3}{2}}$ other face of composition.	1.4478	:	1	:	2.11283
B.—Prism $I = 93° 8'$; $2\bar{i} = 69° 16'$; $\frac{3}{2}i$ (one face of composition) $= 88° 24'$; $\frac{3}{2}\breve{\frac{3}{4}}$ other face of composition; $1\bar{i} = 108° 12'$; $1i = 111° 10'$.	0.7239	:	1	:	1.05617
C.—Prism $I = 109° 14'$; $1\bar{i} = 69° 16'$; $1i$ (one face of composition) $= 88° 24'$; 1, other composition face.	1.4478	:	1	:	1.40822

In the last, the planes, and the faces of composition have all a unit ratio, and it affords the simplest possible view of the crystallization. Whether regarded as the fundamental form or not, the relation to Andalusite is shown by the fact of the two belonging to one and the same series or system of ratios.

Topaz has $I : I = 124° 19'$ and $55° 41'$, and $\breve{i}2 : \breve{i}2 = 86° 52'$ and $93° 8'$. The two prisms might either be taken as the fundamental, with nearly equal propriety. If the first be so taken, and the macrodome of 58° 31′ be the unit one, the axes are $a : b : c = 1.89774 : 1.05625 : 2$ ($= 1.7587 : 1 : 1.8936$), a being treble what it is in Table I, and b double, the b also becoming c or the longer lateral axis. If the unit macrodome is that of 96° 2′, the axes are the same, except that a is half as long.

Lievrite is usually considered as having for its fundamental vertical prism, a prism of 111° 12′. Now this angle is near 109° 14′ for Staurotide (type C); and taking $\breve{i}\frac{3}{2}$ as the vertical prism I, the angle is near that of Andalusite. Moreover the species has near relations in its domes to the species of Table I., and none to those of Table III. Besides, in composition it resembles Andalusite and the allied species, in having less oxygen in its Silica than in its bases. These facts afford some reason for placing the species where it stands in Table I.

The following are notices of other species in Table I.:

Chondrodite has for the summit angle of $1\bar{i}$ in its three types 68° 32′, 64° 54′, 70° 29′, giving as the mean 67° 58′, from which the mean for $\frac{1}{2}\bar{i}$ (taken as $1\bar{i}$ in the table) is 106° 52′, and the extremes 103° 28′ and 109° 26′. The angle for $1\bar{i}$ in the New

Jersey chondrodite is 68°. The great difference of angle for these varieties of a single species should be considered, when judging upon the differences among the several species in the table. Taking 1ī above as the unit dome, the vertical axis is twice that given in the table, or 1.48352. In *Chrysolite*, also, we have as good reason for doubling the vertical axis, in which case it becomes 1.2584. In *Caledonite*, the occurring brachydome has the angle 70° 57′, and taking this as a unit dome, axis $a = 1.53136$.

The relations of *Polianite* to Göthite and Diaspore appear to sustain the conclusion of Volger, cited in the American Journal of Science, vol. xvii., p. 213.

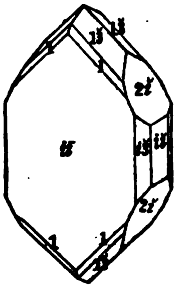
Euchroite is generally placed in a different position, and the prism 117° 20′ (form 1ī) is made the fundamental vertical prism. But it forms no stellate or hexagonal twins like species of that angle, and nothing appears to sustain that view in preference to the one above taken.

Bournonite has the same relation to the species of section II. that Antimony Glance has to those of section I. It has very nearly the angles of Topaz.

Wöhlerite has quite recently been studied by the able crystal-axes, angles (measured over the extremity of the other axis) nearly alike, this other axis is the true vertical, and the vertical prism is near 90° in angle.

Polymignite is near Wöhlerite in its crystallization. With the fundamental form adopted, the known octahedron is $2\bar{2}$ ($2P\bar{2}$), and the occurring prisms are $1\breve{i} = 109° 46'$, $2\breve{i} = 70° 50'$, $4\breve{i} = 39° 9'$.

Polycrase affords angles in three directions near 90°, whichever position be taken. In the figure annexed, the position and lettering correspond to the dimensions given in the table. Should we change it, and make the brachydiagonal the vertical axis, then:



$$I = 93° 52', 1\bar{i} = 91° 29', 1\breve{i} = 95° 2'.$$

And, again, if we make the macrodiagonal the vertical axis:

$$I = 91° 29', 1\bar{i} = 84° 58', 1\breve{i} = 86° 8'.$$

The symbols of these planes in these three positions (which we may call A, B, C,) are as follows:

A (figure)	1	$1\breve{3}$	$2\breve{i}$	$i\bar{i}$	$i\breve{3}$	$i\breve{i}$
B	1	3	$i\breve{2}$	O (base)	$3\breve{i}$	$i\bar{i}$
C	1	$1\breve{3}$	$\frac{1}{2}\breve{i}$	$i\bar{i}$	$\frac{1}{3}\bar{i}$	O (base)

The form is near to Bournonite. It is also related distantly to the Columbite species, the prominent difference being, *five degrees* in the angle of the vertical prism.

The species of Table II. fall into four sections, depending on the angles of the unit domes.

TABLE II.

Angle of Vertical Prism I near 102°.

	Prism *I*.	Dome 1ī.	Dome 1ĭ.	Axes *a* : *b* : *c*.
I.				
Valentinite, ...	(½) 102° 36′	59° 4′	70° 32′	1.7651 : 1 : 1.248
Heavy Spar, . . .	101° 40′	63° 40′	74° 36′	1.6107 : 1 : 1.2276
Anglesite, ...	103° 38′	62° 42′	75° 29′	1.6415 : 1 : 1.2715
Leadhillite, ...	103° 16′	60° 20′	72° 34′	1.7205 : 1 : 1.2632
Celestine, ...	104° 2′	62° 39′	75° 52′	1.6432 : 1 : 1.2807
Anhydrite, ...	102° 56′	61° 25′	72° 38′	1.6836 : 1 : 1.2557
Tantalite, ...	101° 32′	(2ī) 64° 7′	(2ĭ) 74° 58′	1.5967 : 1 : 1.2247
Mascagnine, . . .	107° 40′	65° 52′	83° 6′	1.5437 : 1 : 1.3680
Atacamite, ...	97° 2′	67° 40′	74° 20′	1.4919 : 1 : 1.1310
Sulphur, ...	101° 58′	(⅔ī) 65° 18′	(⅔ĭ) 76° 40′	1.5606 : 1 : 1.2342
"	"	(1ī) 46° 18′	(1ĭ) 55° 36′	2.3443 : 1 : 1.2342
II.				
Orpiment, ...	100° 40′	73°	83° 30′	1.3511 : 1 : 1.2059
Dimorphine (I.), .	98° 6′	75° 40′	83° 40′	1.2876 : 1 : 1.1526
" (II.),	100° 32′	74° 2′	84° 24′	1.3262 : 1 : 1.203
Epistilbite, ...	(½) 100° 58′	(½ī) 70° 50′	(½ĭ) 81° 30′	1.4063 : 1 : 1.2121
Childrenite, ...	104° 14′	73°	87° 14′	1.3514 : 1 : 1.2853
III.				
Prehnite, ...	99° 56′	(2ī) 89° 45′	99° 41′	1.0044 : 1 : 1.1904
Columbite, ...	100° 40′	86° 45′	97° 28′	1.0584 : 1 : 1.2059
Wolfram, ...	101° 5′	88° 6′	99° 13′	1.0337 : 1 : 1.2149
Mengite, ...	100° 28′	87° 24′	97° 54′	1.0463 : 1 : 1.2071
Brookite, ...	100°	83° 14′	93° 16′	1.1260 : 1 : 1.1918

In section I. the angles of the domes oscillate from or about the monometric angles 60° and 70° 32′. In section III., 90° is nearly a mean between the angles of the domes. In section IV., 120° is a similar mean for the domes. Section II. is intermediate between I. and III., the macrodome corresponding with the brachydome of section I., and the brachydome with the macrodome of section III. The vertical axis in section III. is *two thirds* that of section I.; and by taking $\frac{2}{3}\bar{i}$ as $1\bar{i}$, the two groups would coalesce. The vertical axis of section IV. is about *two fifths* of that of I.

In section I. a macrodome of 60° and a brachydome of 70° 32′, *both Monometric* angles, necessarily imply a vertical prism of 101° 34′. Hence the important fact, that *prisms approximating to 101° 34′ are of common occurrence, and a necessary result of the relations pointed out to Monometric forms.* This affords a sufficient reason for the occurrence of so many species near 102° in angle, just as there are many near 90°, and gives special importance to this value of $I : I$. Such prisms have approximately

$$a : b : c = 1 : \sqrt{\tfrac{1}{3}} : \sqrt{\tfrac{1}{2}}.$$

Valentinite affords an interesting exemplification of the general principle. Oxyd of antimony is a known example of dimorphism, occurring in *regular octahedrons* as *Senarmontite*, and in *rhombic prisms* as *Valentinite*. It might hardly be expected that the latter should retain closely any of the angles of the former; and yet there is a brachydome having exactly the angle 70° 32′. The cleavage vertical prism has the angle 136° 20′, which gives for the prism with half the macrodiagonal, 102° 36′,—a relation like that between Hornblende and Augite. The three unit prisms, 102° 36′, 59° 4′, 70° 32′, very nearly correspond to the typical value of the axes $1 : \sqrt{\tfrac{1}{3}} : \sqrt{\tfrac{1}{2}}$.

It is of interest in this connexion to compare *Epistilbite* with Valentinite. It presents the vertical prism 135°, corresponding to 136° 20′ of Valentinite; and there is a macrodome of 109°

46′, whence another macrodome $2\bar{i}$ = 70° 50′, or very nearly the angle of the brachydome of Valentinite. It gives for $i\breve{2}$ the angle 100° 58′, as mentioned in the table. The occurrence of these Monometric angles has, beyond doubt, a profound significance. We hereby perceive in what respect section II. is related to sections I. and III. The oscillations from the typical angles of the group amount to about 5°.

Other species in Table II. require special remarks.

In *Sulphur*, the unit macrodome of authors has the summit angle 46° 18′. But taking $\frac{3}{8}\bar{i}$ as the unit dome, the angle is near that of Barytes and the other sulphates, as in the table; $\frac{1}{8}\bar{i}$ in Sulphur is near $\frac{1}{2}\bar{i}$ in Barytes. *The homœomorphism of Sulphur and the sulphates* (RO, SO^3) *is hence evident.*

Orpiment (sulphuret of arsenic) differs from Sulphur in pertaining to section II. The Sulphur and other arsenic compounds present a like amount of difference; and, further, they show that the fundamental vertical prism of Orpiment is that of 100° 40′, instead of that of 117° 49′, adopted by some authors. The difference in the unit domes of Sulphur and Orpiment is about 7½ degrees, and the difference in the sulphurets and arseniurets sition, falls into the same group with Orpiment, and is near it in angle. Professor Scacchi, in describing Dimorphine,* recognises the fact that it affords two angles approaching those of Orpiment, viz. 83° 40′ and 117° 48′; and he adds correctly, that they do not, however, correspond in position in the two species. But on examining further his type I., and viewing the form in a different position, we find that there are two prisms, which taken as domes give the angles at summit 83° 40′ and 75° 40′ (angles $o : o$ and $e : e$ in Scacchi, pl. 12, f. 4, or $1\breve{i}$ and $1\bar{i}$ in the annexed figure 1); and these angles are so near two domes in Orpiment that we can hardly hesitate as to regarding this the right position for the figures. We here make B of Scacchi the terminal plane O; A, the plane $i\bar{i}$; C, the plane $i\breve{i}$; also o^2 is $\frac{1}{2}\breve{i}$, and m is 1, or the unit octahedron In Scacchi's type II. (figure 2, above), the planes referred to the same fundamental form, are $\frac{5}{4}\bar{i}$ (e of Scacchi, fig. 13, pl. 4), $i\bar{\frac{5}{4}}$ (i), $\frac{5}{4}\,\bar{\frac{5}{4}}$ (m), $\frac{1}{2}\breve{i}$ (o^2). In this type, the angles, as given in the table, are almost identical with those of Orpiment. The axes become for

Fig. 1.

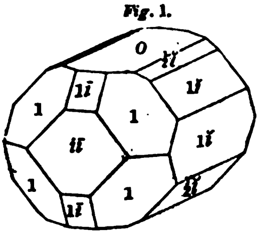
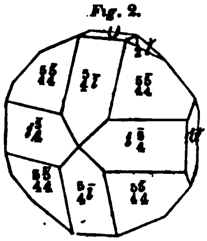


Fig. 2.



$$\begin{array}{lll} & b = 1 & a = 1 \\ \text{Type I, } a : b : c & = 1.2876 : 1 : 1.1526 & = 1 : 0.77661 : 0.89526. \\ \text{Type II, } a : b : c & = 1.3262 : 1 : 1.2030 & = 1 : 0.75405 : 0.90707. \end{array}$$

The ratio $\frac{5}{4}$ in Type II. loses its improbability, if any there be, when it is observed that *the domes of this ratio have approximately the angles of the unit domes of sulphur* or of the section to which sulphur belongs, they being $\frac{5}{4}\bar{i}$ = 62° 12′ ($e : e$, f. 13, of

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* Memorie Geologiche sulla Campania per A. Scacchi, Napoli, 1849, p. 120

Scacchi), and $\frac{4}{3}\breve{i}$ (not observed) = 71° 56′. They approach most nearly the unit domes of Anhydrite.

Tantalite (FeO, TaO^3) has very nearly the dimensions of Barytes (BaO, SO^3), as seen in the table; and the fact is important, as it sustains the *homœomorphism of tantalic and sulphuric acids.*

Brookite was first observed to be homœomorphous with Columbite by Hermann. It differs by four degrees in its domes from that species, and has its vertical axis about one twelfth longer.

In *Columbite*, it is of importance to note, that the face of twin composition is a plane of the brachydome $2\breve{i}$, in which the *basal* angle is about 120°; and in *Wolfram*, it is the brachydome $\frac{2}{3}\breve{i}$, in which the *summit* angle is about 120°.

Leadhillite has been shown by the writer to have close relations in angle to Anglesite, in the American Journal of Science, vol. xvii., p. 210. Its dimensions, as given in the table, exhibit still further this similarity of form. We reserve remarks on the forms of Leadhillite for another occasion.

Mascagnine diverges widely from the other sulphates in its vertical prism, and therefore also in its brachydome, while it

TABLE III.

Angle of Vertical Prism, near 109° 28′.

	Prism *I.*	Dome 1ī.	Dome 1ĭ.	Axes *a* : *b* : *c.*
I.				
Marcasite, . . .	106° 5′	64° 52′	80° 20′	1.5737 : 1 : 1.3287
II.				
Mispickel, . . .	111° 53′	59° 14′	80° 8′	1,7588 : 1 : 1.4793
Leucopyrite, . .	111° 30′			
Aurotellurite, . .	110° 48′	(2ī) 58° 52′	(2ĭ) 78° 34′	1.7723 : 1 : 1.4496

The angle of the vertical prism in Table III. is near the angle of a regular octahedron (109° 28′). As this prism is a cleavage prism, and the only distinct one in the species, it appears to be the true vertical prism.

But if we give the species another position, we may exhibit a relation to sections II. and III. of Table II.; and as they are all related to the species of those sections in composition, this relation is of fundamental interest. Making the brachydome 1ĭ the vertical prism, then the angle given above for the vertical prism is the new macrodome, and the supplement of that for the macrodome is the new brachydome. This gives for Mispickel the angles *I*: *I* = 99° 52′; 1ī : 1ī = 111° 53′; 1ĭ : 1ĭ = 120° 46′. If we now double the length of the vertical axis, the dome 111° 53′ becomes ½ī, and 120° 46′ ½ĭ; and the three angles will be

I: *I* = 99° 52′; 1ī : 1ī = 72° 58′; 1ĭ : 1ĭ = 82° 40′,

which are almost identical with the angles in Orpiment. The following table presents the angles and axes of the species thus changed in position, and also those referred to on Table II.

It appears from the table that *Marcasite*, $\mathrm{Fe\,S^2}$, is very near Sulphur in its angles and axes; while *Aurotellurite* (Ag, Au), $\mathrm{Te^2}$, and *Mispickel*, $\mathrm{Fe\,(S,\,As)^2}$, to which *Leucopyrite*, $\mathrm{Fe\,As^2}$, should be added, have the form nearly of Orpiment. It is a question, therefore, whether Table III. should not be suppressed, and the

TABLE III. A.

	Prism *I.*	Dome 1ī.	Dome 1ĭ.	Axes *a* : *b* : *c*.
I.				
Sulphur, . . .	101° 58′	65° 18′	76° 40′	1.5606 : 1 : 1.2342
Marcasite, . . .	99° 40′	67° 12′	76° 24′	1.5049 : 1 : 1.1847
II.				
Orpiment, . . .	100° 40′	73°	83° 30′	1.3511 : 1 : 1.2059
Dimorphine, (I) .	98° 6′	75° 40′	83° 40′	1.2876 : 1 : 1.1526
Do. (II) .	100° 32′	74° 2′	84° 24′	1.3262 : 1 : 1.2030
Mispickel, . . .	99° 52′	72° 58′	82° 40′	1.3520 : 1 : 1.1890
Aurotellurite, . .	101° 26′	71° 52′	83° 6′	1.3797 : 1 : 1.2225

species annexed to sections II. and III. of Table II. The cleavage constitutes the main reason for regarding the species as a separate Group. But notwithstanding the peculiarity in this respect, the affiliation with Sulphur and Orpiment is undoubted.

TABLE IV.

Angle of Vertical Prism, near 120° (115⅗°–120°).

	Prism *I.*	Dome 1ī.	Dome 1ĭ.	Axes *a* : *b* : *c*.
I.				

II. Angle of brachydome near 109° 28′.
III. Angle of macrodome near 109° 28′.
IV. Angle of brachydome near 120°.

The vertical axis in section II. is about one fourth shorter than in section I.; in the latter $\frac{3}{4}\bar{\imath} = 85° 40'$, which approaches $1\bar{\imath}$ in the former, being very nearly the angle of Stephanite.

Chrysoberyl is very near Aragonite in angle, if the plane in the former usually regarded as $\frac{3}{2}\bar{\imath}$ be taken as $1\bar{\imath}$, as adopted in the table: otherwise the relation for the vertical axes of the two species is that of 3 : 2. So also *Copper Glance* approaches Aragonite, if what has been taken by authors as $\frac{2}{3}\bar{\imath}$ be regarded as $1\bar{\imath}$; otherwise the relation between them is that of 2 : 3. Such ratios, as we have elsewhere remarked, and the tables everywhere illustrate, are consistent apparently with homœomorphism in species. We have not sufficient data, at present, to decide whether the relation between Aragonite and Copper Glance is actually that of 1 : 1 or of 2 : 3, yet are inclined to believe the latter the fact; and if so, $1\bar{\imath}$ in Copper Glance has 61° 54′ for the summit angle, and 118° 6′ for the basal; the latter angle is near that of the vertical prism.

Many of the species in Tables I. to III. afford a horizontal prism or unit dome of 115° to 120°; and consequently, if this dome were taken as the fundamental vertical prism, the species would pertain to Table IV. Although we have not good reason for making the change, it is of some importance to view the species in this way, in order to apprehend more fully all the affiliations and relations of the forms. The author has alluded to Hausmann's comparisons by this method, of the anhydrous sulphates and carbonates; and he would here observe that the general review of Trimetric forms which he has made since his former paper was printed, and which has been here presented, has led him to give more importance to such comparisons than was implied in his paper in the American Journal of Science, vol. xvii., p. 210.

In the annexed table the first column contains a statement of the particular dome in the preceding Tables which is here made the vertical prism; in some cases the angle of this prism is the supplement of that which is given for the dome in those Tables.

TABLE IV. A.

		Prism *I.*	Dome 1ī.	Dome 1ĭ.
From Table I.				
Chrysolite, ...	1ī	115° 36′	60° 48′	85° 57′
Do.	1ĭ	119° 12′	64° 24′	94° 3′
Triphyline, ...	1ī	118° 27′	58° 5′	86°
Do.	1ĭ	121° 55′	61° 33′	94°
Epsomite, ...	1ī	120° 4′	59° 27′	89° 26′
Do.	1ĭ	120° 33′	59° 56′	90° 34′
Diaspore, ...	1ī	115° 16′	61° 18′	86° 8′
Do.	1ĭ	118° 42′	64° 44′	93° 52′
Göthite, ...	1ī	113° 6′	62° 30′	85° 8′
Do.	1ĭ	117° 30′	66° 54′	94° 52′
Polianite, ...	1ī	115° 26′	62°	87° 8′
Do.	1ĭ	118°	64° 34′	92° 52′
Euchroite, ...	1ī	117° 20′	60° 47′	87° 52′
Do.	1ĭ	119° 13′	62° 40′	92° 8′
Topaz, ...	1ī	$(\frac{4}{3})$ 115° 22′	61° 50′	86° 52′
Do.	1ĭ	$(\frac{1}{3})$ 118° 10′	64° 38′	93° 8′
Bournonite, ...	1ī	$(\frac{2}{3})$ 115°	61° 46′	86° 20′
Do.	1ĭ	$(\frac{2}{3})$ 118° 14′	65°	93° 40′

Comparing the species in Table IV. A, with those of Table IV., we observe the following affiliations:—

Marcasite and Aurotellurite are near section I. (Sternbergite).

From Valentinite to Sulphur (from Table II.) are near section II. (Aragonite section).

From Chrysolite to Bournonite (from Table I.), with also Manganite, are not coincident with either section of Table IV., but they have approximately the ratio to the Aragonite section of 4 : 3. This is the ratio between Chrysolite and Chrysoberyl. If 119° 12′ in Chrysolite be considered as corresponding to 119° 46′ in Chrysoberyl, then the macrodome of 64° 24′ in Chrysolite, if referred to the form of Chrysoberyl, would be $i\,\frac{4}{3}$.

From Calamine to Cotunnite, the vertical axis is to that of the Barytes series nearly as 5 : 3.

In reviewing the Groups of Trimetric forms, the most prominent fact observed is the prevalent approximation in the values of the angles of the unit prisms, to the three monometric angles, 90°, 109° 28′, and 120°, or their supplements, 70° 32′, and 60°; above all, the angles approaching 109° 28′ and 70° 32′ much predominate. When the vertical prism is near 90°, domes near 109° 28′ and 70° 32′, characterize very many of the species; while domes near 120° belong to the rest of the species. And in the second great group, macrodomes near 70° 32′, and 109° 28′, and brachydomes near 60° and 120°, determine the vertical angle of the prism, which approaches 101° 36′. Another large group has 120° and 60° as approximately the angles of the vertical prism.

The fact that the axial ratios $1 : \sqrt{2}$ and $1 : \sqrt{3}$ are typical of certain groups has been mentioned. It is easy to make out, in many cases, simple ratios between the axes, or the sum of two of the axes and the third; but the importance that should be attached to such ratios is questionable. The following are a few examples:—

	Axes a	: *b*	: *c.*	
Epistilbite (I=100° 58′),	1.4063	: 1	: 1.2121	$a+b=2c$.
Calamine, ...	0.6170	: 1	: 1.2776	$2a=c$.
Brochantite, ...	0.6434	: 1	: 1.2838	$2a=c$.
Cotunnite, ...	0.5953	: 1	: 1.1868	$2a=c$.
Haidingerite, ...	0.5945	: 1	: 1.1918	$2a=c$.
Göthite, ...	0.6606	: 1	: 1.0888	$3a=b+c$.
Polycrase, ...	1.0265	: 1	: 1.0913	$2a=b\ \ c$.
Valentinite, ...	1.7651	: 1	: 1.248	$2a=b+2c$.

In Valentinite this relation is evidently dependent on the more authoritative and equally exact ratio $a : b : c = 1 : \sqrt{\tfrac{1}{3}} : \sqrt{\tfrac{1}{2}}$.

Many conclusions bearing on chemical formulas, and the chemical relation of species, flow from the facts in the preceding tables. But we leave, for the present, that branch of the subject without further remarks.

IX.—*Descriptions of Three New Species of* PISIDIUM.

Remarks.—A rare shell; more inflated and heavier than either *P. compressum* or *P. altile.*

2. Pisidium contortum.

CABINET OF THE NEW YORK LYCEUM OF NATURAL HISTORY.

Plate I. Fig. 2, *a*, *b*, *c*.

Shell small, elongated; beaks large and prominent; anterior margin very abrupt, posterior one less so; slight ridges from the beak towards the inferior part of the anterior margin. Sulcations slight. Length 0.13, Breadth 0.07, Diam. 0 5 inches.

Habitat.—Found subfossil at Pittsfield, Mass., in company with *P. ventricosum.* (Shurtleff.)

Remarks.—This is a singular species, unlike any other of this country. Its foreign analogue is the *P. sinuatum* of Bourguignat. See Petit's Jour. for 1852, page 49.

3. Pisidium Noveboracense.

CABINET OF THE NEW YORK LYCEUM OF NATURAL HISTORY.

Plate I. Fig. 3, *a*, *b*. *c*.

Shell large, high, not much elongated, full; beaks prominent and large; anterior margin elongated, posterior one curved. Sulcations not very light. Color varying from greenish-yellow to brown. Interior light blue. Length 0.35, Breadth 0.18. Diam. 0.13 inches.

Habitat.—Washington County, N. Y. (Ingalls), and Herkimer County, N. Y. (Lewis).

Remarks.—This is one of our largest American species. Compared to the *P. dubium*, it is less elongated, less robust, less heavily marked, and differently colored. Found in plenty.

X.—*On the Identity of* CYCLAS ELEGANS Adams, *with* CYCLAS RHOMBOIDEA Say.

By TEMPLE PRIME. *Read September* 5, 1852.

In 1822, Say published as follows, in the Jour. of the Acad. of Nat. Sci., vol. ii., page 380:—

> "*Cyclas rhomboidea.*—Shell transversely orbicular, rhombiform, subequilateral, pale with elevated somewhat transverse lines, umbo not prominent.
>
> "*Long.* more than one quarter of an inch. It inhabits Lake Champlain. It is probable this species attains a larger size than the two spe-

It was not until the summer of 1852, that having collected some *C. elegans* in the waters of the same lake, I was impressed with the idea that this might be Say's shell.

On comparing figure 4 on plate I. (which is a true representation of both the adult and young of *C. elegans*), with Say's description, it will be found to tally in every respect, especially if we take into consideration that the specimens from which Say described, were not adults.

Say's and Adams's descriptions are not quite similar; Say's is shorter, but it is concise, and contains all that is requisite; it approaches nearer to Gould's. Say and Adams, however, both make the shells out to be rhomboidal, to have beaks that are not prominent, and to be the same in coloring.

Little as I like changing a well established name, I think it, nevertheless, obligatory in this case; and I have hopes that naturalists, taking the three following very forcible reasons, first, that the *C. elegans* answers the description of Say's *C. rhomboidea;* secondly, that it is found in the same locality; and thirdly, that no other *Cyclas*, coming at all under the scope of Say's description, has ever been obtained from Lake Champlain; will see the necessity of the change, and will side with me for the future, in considering Adams's *C. elegans* as Say's *C. rhomboidea*, and in labelling it as such.

Dekay, in his Report, has described and figured the adult of this species under its true name; the young, however, he calls *C. elegans.*

XI.—*Catalogue of the Terrestrial and Fluviatile Shells of St. Thomas, West Indies, by* R. J. Shuttleworth, *of Berne, Switzerland, Corresponding Member.*

Communicated by T. Bland.* *Read Feb.* 6, 1854.

1. (21.) Helix vortex Pfr. Habitat etiam in Portorico.

2. (23.) Helix subaquila[†] Shuttl. n. sp. Differt ab *H. Boothiana Pfr.* et *H. peraffinis C.B.Ad.*, umbilico angustiore, spira depressiore, et colore sæpe pallide corneo vel infumato. An forsan *H. spreta* C. B. Ad. species mihi ignota. Habitat copiosissime in Portorico.

3. (22.) Helix euclasta Shuttl. n. sp. Differt ab *H. fragilis Pfr.*, cui maxime affinis, costulis confertioribus, minus pro-

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* In October, 1852, with the assistance of the late Professor C. B. Adams, I prepared a "Catalogue of the Terrestrial Shells of St. Thomas, W. I," which was published in Part XI. of his "Contributions to Conchology." At the same period

minentibus et statura majori;—altera species affinis (*H. musicola mihi*), habitat in Portorico, spira *acute elevata* maxime distincta.

4. (24.) HELIX GUNDLACHI Pfr. Copiosissime habitat etiam in Portorico.

5. (19.) HELIX INCERTA Fer. Vera species Ferussaciana,—et distincta ab exemplaribus sub hoc nomine semper distributis, qualia tantum ex insula St. Johannis accepi. Hæc species est *H. notabilis* (*mihi*). = *H. lima*, *var. notabilis Fer.* = *H. alutacea Ziegl.* ined. *H. incerta Fer.* est autem subfossilis.

6. (20.) HELIX NEMORALINA Petit. Specimina majora habitant in insula St. Johannis.

7. (11.) BULIMUS VIRGULATUS (Fer.). Etiam in Portorico.

8. (12 and 13.) BULIMUS FRATERCULUS (Fer.). Ut mihi videtur, ex lineis spiralibus evidentibus epidermidis quasi fimbriatis. Conf. Potiez et Mich. in Cat. de Douai; Species quoad formam, staturam, marginesque peristomatis magis vel minus conniventes, valde variabilis, in Portorico copiosissime occurrens. *B. sepulcralis** *Poey*, vix etiam distinctus. *B. Dysoni*, fide specim. differt characteribus plurimis. In *B. fraterculo* character eximium semper adest, nempe nucleus (anfr. primordiales 1½) pulcherrime granulosus, granulis rhombiformibus; anfr. sequentes autem lineis spiralibus eximie ciliati.

9. (10.) BULIMUS GUADALUPENSIS Brug. Nomen Brug. retinendum. *H. exilis Gmel.* ad *figuras* tantum conferta, plurimas species continet (*B. virgulatus Fer.*, &c.) Etiam in Portorico.

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* Pfeiffer (fide Poey) considers this a good species, and Poey thinks it distinct from *B. fraterculus*, in which I coincide. T. B.

10. (14.) STENOGYRA* SUBULA (Pfr.). Etiam in Portorico.

11. STENOGYRA OCTONOIDES (C. B. Ad.). " "

12. STENOGYRA GOODALLI (Müll.). " "

13. (15.) STENOGYRA SWIFTIANA (Pfr.). " " copiosissime.

14. (7.) STENOGYRA OCTONA (Chem.). " "

15. (8.) ACHATINA SUBTILIS Shuttl. n. sp. Ab *A. pellucens C. B. Ad.* certe distinctissime, et ut videtur indescripta. Columella valde involuta et arcuata basique truncata.

16. (9.) ACHATINA GUNDLACHI Pfr.† Specimina Pfeifferiana non vidi,—certe distincta ab *A. iota C. B. Ad.*,—spira aciculari magis acuminata, et statura majore. Habitat etiam in Jamaica.

17. (16.) SPIRAXIS ? (sectio nova "Geomelaniformes") EJUN-

18. (17.) PUPA SERVILIS* Gould. Specimina authentica cl. auctoris nondum vidi. *P. pellucida* et *marginalba Pfr.* mihi etiam ignotæ. *P. Riisei* Pfr. mihi hucusque nec ex St. Thomas, nec ex Portorico obvia. *P. servilis Gould* habitat etiam in Portorico.

19. (6.) MACROCERAMUS MICRODON (Pfr.). Varietas major, anfr. planioribus, &c., habitat in Portorico, sed rarior.

20. (5.) CYLINDRELLA PALLIDA (Guild.). Forma major, habitat etiam in Portorico.

21. (18.) SUCCINEA APPROXIMANS Shuttl. n. sp.? Habitat etiam in Portorico. Differt ab *S. Sagra Orb.* spira multo magis elevata,—sed etiam distincta a *S. fulgens Lea.*

22. (1.) CYCLOSTOMA (MEGALOMASTOMA) ANTILLARUM Sowb.—etiam in Portorico.

23. (2.) CYCLOSTOMA (CHONDROPOMA) NEWCOMBIANUM C. B. Ad.

24. (3.) HELICINA SUBFUSCA Mke. Annon species *immatura*?†

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individuals from Florida, and sent to me magnified outlines of both, taken with a camera lucida. He remarks: "The number of ribs is the same, though this number varies in different specimens, as does the size of the ribs." T. B.

* I lately submitted specimens from St. Thomas to Dr. A. A. Gould, who found them "to correspond in all respects" with his shell. T. B.

† I cannot distinguish young unfinished specimens of *H. striata Lam.* from these. May it not be the *H. striata* transported from Portorico, and never attaining full size and perfect state, as is the case with *B. decollatus* in the Canaries? R. J. S.

The physical circumstances under which the animals live in the two nearly adjacent islands are, I must think, the same, and I cannot, therefore, adopt the suggestion of Mr. Shuttleworth. T. B.

25. (4 *a.*) HELICINA FOVEATA* Pfr. fide Bland in litt. Species distinctissima, cujus varietas minor (plerumque immatura) est—

(4.) H. FOVEATA *var. β. rubella. H. rubella Pfr.* fide Bland. in litt. Occurrit var. etiam in Portorico.

26. TRUNCATELLA SUBCYLINDRICA Gray. *Tr. Caribœensis Sowb.* eadem species quam *T. succinea C. B. Ad.*, est species distincta, quem tantum ex Jamaica accepi,—differt species Jamaicensis ab specie St. Thomasi, statura multo majori, anfractibus valde planatis, et præsertim carina basali dealbata conspicua.

27. TRUNCATELLA PULCHELLA Pfr.

28. TRUNCATELLA CLATHRUS Lowe—a Blaunero tantum lecta. Truncatellæ omnes etiam a Portorico accepi.

29. PLANORBIS DECIPIENS C. B. Ad? Specimina juniora pulcherrime crystallina.

30. PLANORBIS CIRCUMLINEATUS Shuttl. n. sp. (Specimina tua majora et valde erosa, forsan a sp. Blaunerianis distincta?)

34. AMNICOLA CRYSTALLINA* (Pfr.).
" " var. β. *coronata* (*Paludestrina coronata Pfr.*). Etiam in Portorico.

35. NERITINA VIRGINEA (Linn.). Habitat etiam in Portorico.

36. NERITINA MELEAGRIS Lam. " " "

37. NERITINA VIRIDIS Lam. " " "

38. MELAMPUS CONIFORMIS (Brug.). " " "

39. MELAMPUS MONILIS (Lam.). " " "

40. MELAMPUS NITENS (Lam.). " " "

41. PEDIPES QUADRIDENS Pfr. " " "

42. ODOSTOMIA (TORNATELLINA) CUBENSIS† (Pfr.). Habitat etiam in Portorico.

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* I cannot distinguish these as more than forms of the same species, as I find every passage from the smooth to the aculeated shell. As the smooth form is most abundant, I take it as the type of the species. *Paludestrina Candeana Orb.* appears to be different—it is from Guadaloupe, and is probably the same as *Melania spinifera C. B. Ad.*, which differs from the Cuba and St. Thomas species not only in greater breadth, but by scarcely any appearance of perforation or rima. From Portorico I think I have one or two other species, but am not yet clear how far differences in size, and greater or less acumination of the spire, are characteristic in this difficult genus. The name *Amnicola* must be retained in preference to *Hydrobia Hartm.*, *Paludinella Pfr.*, and *Paludestrina Orb.* R. J. S.

† This is a litoral (marine) shell—it was collected by Blauner with species of *Rissoa*, *Scutella*, &c., and sent with them marked *marine.* It will rank with *Truncatella*, *Auricula*, and *Pedipes*, in its claim to being land or freshwater. It is decidedly no *Tornatellina*, and I have no doubt of my supposition that it is an *Odostomia.* The solidity of the shell, its glossy appearance, &c., are quite different from the true *Tornatellinæ.* R. J. S.

XII.—*Note on the Geographical Distribution of the Terrestrial Mollusks which inhabit the Island of St. Thomas, W. I.*

By T. Bland. *Read, March* 6, 1854.

The land shells which are common to St. Thomas and Portorico are indicated in Mr. Shuttleworth's Catalogue of the species of the former island. *H. vortex Pfr.* is widely distributed in the West Indies. *H. Gundlachi Pfr.* is found in Cuba, and *H. nemoralina Pet.* in St. John. *H. euclasta Shuttl.*, so far as our knowledge at present extends, and perhaps also *H. incerta Fer.*, are peculiar to St. Thomas,—the latter only subfossil. *H. notabilis Shuttl.* occurs in St. John, Anegada, and St. Bartholomew. Pfeiffer attributes it (*H. lima Fer. var. notabilis*) to Curaçoa, on the authority of Beck. *Bulimus virgulatus* (*Fer.*), and *B. Guadalupensis Brug.* inhabit St. John, and have otherwise a wide distribution. *B. fraterculus* (*Fer.*) occurs in several of the West India Islands. The *Stenogyræ* of St. Thomas are, I believe, widely distributed,—none are peculiar to that island.

logue to be good species), only four, viz. *Helix euclasta Shuttl.*, *H. incerta Fer.*, *Spiraxis? ejuncida Shuttl.*, and *Achatina subtilis Shuttl.*, are peculiar to the island, while no less than seventeen of the species are known, on the like testimony, to occur in Portorico, having been collected there by the late Mr. Blauner for Mr. Shuttleworth. On the other hand, at least nine of the species inhabit St. John,—a number very likely to be increased by further researches in that island. It may be remarked that *H. euclasta Shuttl.* is closely represented in Portorico by *H. musicola Shuttl.*,—*H. incerta Fer.* by *H. notabilis Shuttl.* in St. John, &c., and *S.? ejuncida Shuttl.* by *B. gracillimus Pfr.* in Cuba, &c., so that the peculiarities of the fauna of St. Thomas, as regards land shells, are trifling. In the larger islands, especially Cuba, Hayti, and Jamaica, the proportion of species found exclusively in each is very considerable. The species which have the widest distribution in the West Indies, seem to be those which from their habits are most liable to removal by human agency; but the opinion now gaining ground, that many individuals of a species were originally created in different parts of its geographical area, must not be overlooked.

XIII.—*On the Absorption of Parts of the Internal Structure of their Shells, by the Animals of* STOASTOMA, LUCIDELLA, TROCHATELLA, HELICINA, *and* PROSERPINA.

By T. BLAND. *Read February* 27, 1854.

The power which mollusks possess of dissolving portions of their own shells has been long known. This power is exerted by some with a view to remove impediments to their growth,—

the *Murices*, for instance, destroy external spines, and the *Purpuræ* wear away the walls of their apertures. Cones and Olives reduce the thickness of the septa between the whorls of their shells. A species of Harpa (*H. articulata*) is said to absorb only the central part of the septa, so as to leave a slit between the cavities of the different whorls. Other Mollusks carry this absorption of parts of their shells to a still greater extent. The Neritidæ and Auriculidæ dissolve all the internal spiral column, as shown in the accompanying specimens.

I was not, however, aware until within the last few days, that this alteration of internal structure prevailed in *Stoastoma*, *Lucidella, Trochatella, Helicina*, and *Proserpina*,—the latter genus non-operculated; possibly the fact has been observed by others.

While examining a broken young shell of *H. maxima Sowb.* from Jamaica, I noticed the absence of the internal spiral column and septa. The smoothness of the interior of the shell beneath the apex, and particularly along the line of the sutures of the upper whorls, precluded the idea of accidental injury to the shell. On opening more individuals of the same and other species of *Helicina*, and of *Lucidella, Trochatella*, and *Stoastoma*, takes place before the thickening of the lip, is shown in the young shell of *H. maxima.*

What object the animals gain by this operation, I am at a loss to conjecture, unless it be that they require more space for the development of some organs at a certain stage of growth, than the continued existence of the spiral column and septa would permit. But I would ask whether any, and if so, what structural peculiarity exists in the Terrestrial and other Mollusks, in whose shells the spiral column and septa are removed, which renders it necessary for them to effect such an alteration of their habitations?

XIV.—*On* PROSERPINA OPALINA *C. B. Ad., and* HELIX PROSERPINULA *Pfr.*

By T. BLAND. *Read March* 6, 1854.

Having noticed (as explained in a paper lately read before this Society) the removal of the spiral column and septa in shells of six species of *Proserpina* (Pfeiffer enumerates eight species in the third volume of his *Monographia*), I examined the shells of *P. opalina* C. B. Ad., and *Helix Proserpinula* Pfr.

The former shell was originally called *Helix hyalina* by Adams (fide Pfeiffer in Monog.), in some schedule, of the date of which I am ignorant, but was first described by Adams in January, 1845, in the Proceedings of the Boston Society of Natural History, as *Helix opalina.* In June of the same year, Pfeiffer described it in the Zeitschrift as *H. margarita.* It was included by Adams in his Catalogue of Jamaica Helicidæ, published in the Annals of the Lyceum, vol. v., and in the Contributions to Conchology, in 1849, as a *Proserpina*, probal cause Pfeiffer had referred it in 1848 to *Odontostoma*,* first volume of his Monographia.

Helix Proserpinula Pfr., was first described as *P. disco* 1850, by Adams, in the Contributions. He there rema "This species is nearly allied to *P. opalina.* Being a g *Proserpina* without teeth, it suggests the propriety of o the phrase 'apertura intus dentata,' from the description genus." In 1850 Pfeiffer described it as *H. Proserpinula* Zeitschrift.

It turns out, curiously enough, that Adams was right garding *Proserpina opalina* as a Helix, and that it was ferred in error by Pfeiffer to *Proserpina;* and on the hand, that Pfeiffer was correct in referring Adams's *P. d* to Helix. This is, I think, satisfactorily proved by th that in both the spiral column and septa remain intact, pears always to be the case in *Helix.* I exhibit specim both species, opened so as to show the alteration of i structure.

The return of this species to the genus *Helix* renders

XV.—*Description of a New Species of Bird of the Genus* LARUS Linn.

By GEORGE N. LAWRENCE. *Read March 7, 1854.*

Larus Californicus.

THE CALIFORNIAN GULL.

Bill rather slender, and much curved; wings extending a little beyond the end of the tail; legs and feet small; tail even.

Adult.—Bill yellow, upper mandible pale, except from the base, as far as, and on a line with, the nostrils, where it is of a dull green, just beyond the nostrils is a transverse blackish mark, which reaches nearly to the ridge, under mandible bright yellow, dusky on the sides, at the angle it is crossed by a black spot or bar, bordered with reddish orange; the mark on the upper mandible is opposite to this; head white, except the crown and occiput, which are light ash, the feathers of the hind part and sides of the neck have their centres blackish ash; neck, entire under plumage, rump and tail white; mantle and wings pearl-blue; the six outer primaries are crossed by a band of deep black, the first is almost entirely of this color, but it gradually becomes less to the sixth, on which it is reduced to a narrow subterminal bar; all the primaries are tipped with white, on the exterior one the white is about two inches in extent, and has a black bar dividing it near the tip, there is a small white spot on the outer web of the second, next the shaft, and about one inch and a half from the end; the secondaries terminate with white; legs and feet (in the dried specimen) dull greenish yellow; claws black.

Total length of skin, 23 inches; wing, from flexure, 15¼; tail, 6½; bill, along ridge from front base to point, 2, from rictus to point of lower mandible, 2¾; height of bill at the angle, $\frac{11}{16}$; bare space on tibia, ¾; tarsus, 2⅛; middle toe and nail, 2¼; inner toe and nail, 1¾; hind toe and nail, ½ inch.

Habitat.—California.

The specimen described was presented to me by E. S. Holden, Esq., who shot it on the San Joachin River, near Stockton

It belongs to the group of Gulls which includes *L. argentatu* *Linn.* and *L. occidentalis Aud.* The bill is weaker and mor slender than in either of these, that of *L. occidentalis* being relatively large, and having great depth at the angle, the tarsi an toes are comparatively much shorter than in either of the abov allied species. The mantle is many shades darker than that o *L. argentatus*, but not so dark as that of *L. occidentalis* (which i slate blue), being about intermediate in color.

The dark feathers on the neck probably denote its winte plumage; in summer the entire head and neck is, no doub white.

our Western streams and rivers abound. The journey was extended as far as Macon, in Georgia, when heavy and continuous rains arrested further progress, by swelling the streams so high as effectually to debar all collecting. From the unusual fulness of most of the other streams visited during the journey, the number of *Naiades* obtained was restricted, but large quantities of *Melanidæ* were collected. Some of these were of old and well known species; others represented species which, though already named and described, are as yet little known in collections, or have been described from solitary or imperfect examples. The species named and characterized in the following pages, with others to appear hereafter, consist, for the most part, of the *new* acquisitions made during this journey.

The author regrets his inability to give a more precise statement of habitat than that here assigned to most of his species; but the precautions he had taken for keeping his collections distinct proved insufficient, and he, therefore, prefers to merely name the *State* in which they were taken,—viz. Kentucky, Tennessee, &c.,—rather than misstate the *stream* where found. The waters from which the specimens were collected were so various, and often so obscure, as to increase this difficulty. Many of them, in fact, are unhonored with a name, being mere springs, sometimes scarcely a foot wide, and a few inches deep. The abundance of this form of animal life in this part of the world, not only in species, but also in individuals, is inconceivable to those accustomed to its paucity in the Eastern States. In Kentucky, Tennessee, and Georgia, no running water is too insignificant to be altogether devoid of shells. Among these, *Melaniæ* are strikingly abundant; and, indeed, so far as noticed, they were almost the sole denizens of the small streams. I cannot recollect having seen a single specimen of *Limnæa* or *Physa* in all the route. Only two or three species of *Paludina*, no *Planorbis*, perhaps two species of *Cyclas*, and only one *Ancylus* (*A. elatior* nobis), a new species from Green River, Kentucky.

The most prominent streams examined were Green River, Barren River, Beaver Creek (a branch of Barren), Nolen River (a branch, I believe, of Salt River), all in Kentucky; and in Tennessee, the Cumberland River, Cany fork of Cumberland, Collins River, Rock River, Defeated Creek, Battle Creek, Chattanooga Creek, Holston, French Broad, Tennessee River, Mine-lick Creek, and Sequatchee River; while in Georgia, the Ochmulgee, Chattahoochie, Etowah, Coosa, Oostanulla, Connesauga, Sumac Creek, and Rock Creek, were examined,—and in all these States, hundreds of smaller streams, of every grade, tributary to those I have mentioned.

My means of carriage being limited, but little time was devoted to any one stream, as a few minutes only sufficed to gather two hundred specimens of each species. Generally not more than three species were found in these small streams at any one point, and to gather four or five hundred specimens, twenty minutes was ample time. Every stone in these streams, every piece of floating wood, and, where both were absent, even the muddy bottom, was covered by Melaniæ, and I only had to strip them off with my hands, and select the full grown ones. In Cany fork, I collected twelve hundred and the Sequatchee, two rapid, noisy, rocky streams, favorable to that genus, which cannot bear a sluggish, muddy river at all. I never found *Anculosæ*, even when abundant, save in *the most rapid current of a* stream, where they cling to the stones or rocks, generally in quite deep water. They cling to these stones with no ordinary tenacity, and it requires some exertion often to dislodge them. As one might suppose, their peculiar fondness for the most rapid parts of the most rapid rivers is not favorable to perfection of specimens; and hence, in this genus, the erosion of the apex forms, in most cases, a conspicuous character. The *Io* seems to be closely allied to the *Anculosa* in this respect, and inhabits deeper water. Geese are said to devour the *Melaniæ* in great quantities, and often to suffer from the abundance of such a diet.

Should his life and strength be continued, the author hopes, in due season, to furnish a complete monograph of the Melanidæ of the United States, in which an attempt will be made to establish the *true* species, to rectify the nomenclature of those regarded as erroneous, and to perfect such previous descriptions as were founded on insufficient material.

1. Melania athleta.

Plate II. Fig. 1.

T. conicâ, subglabrâ, fusco-corneâ, juxta suturas pallidiore; spirâ elevatâ; anfractibus 10, subplanis, obscurè plicatis, plicis deorsum obsolescentibus; suturis impressis; aperturâ ovatâ, intùs albido-rubescente; columellâ incurvâ, in sinum tenuem productâ.

Shell conical, nearly smooth, dark horn color; spire much elevated; whorls 10, nearly flat, with faint longitudinal ribs, most distinct on the upper part of the whorls; sutures well marked; aperture small, ovate, within whitish, tinged near the base with rose; columella rounded, and forming a slight sinus at base.

Length 1.25 inches (32 millimetres). Diam. 0.40 inch (10 millim.).

Length of aperture 0.40 inch (10 millim.).
Breadth of do. 0.23 inch (6 millim.).

Habitat.—Tennessee.

My cabinet. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd.

Obs.—A stout species, and one of the most beautiful with which I am acquainted. The ribs are not strongly expressed, and on the lower whorls are nearly obsolete, having there the appearance of striæ of growth merely. Body whorl a little angulated at base.

2. **Melania viridula.**

Plate II. Fig. 2.

T. conicâ, glabrâ, subcrassâ, prasinâ; spirâ elevatâ; anfr. subconvexis; suturis impressis; aperturâ ovatâ, parvâ, intùs albidâ; labro sinuato; columellâ incurvâ, in sinum profundum productâ.

of whorls, and size and color of aperture. Differs from *M. regularis Lea* by its less number of whorls, and their convexity, as well as by its peculiar green color.

3. **Melania hastata.**

Plate II. Fig. 3.

T. conicâ, glabrâ, subcrassâ, nigro-castaneâ; spirâ elevatâ; anfr. 8–9, vix convexis, striis spiralibus exilibus raris cinctis, ultimo vix angulato; lineâ flavâ prope basim obscurè cincto; suturis leviter impressis, albolineatis; aperturâ parvâ, elongato-ovatâ, intùs purpureâ; labro sinuato; columellâ tortâ, incurvâ, purpureâ, in sinum latum productâ.

Shell conical, smooth, rather solid, dark chestnut; spire rather obtusely elevated; whorls 8–9 in number, slightly convex, with occasional delicate spiral striæ, the upper ones subcarinate; body whorl subcarinate, with a narrow yellowish band beneath the angle; sutures moderately impressed, yellowish; aperture small, pyriform, purple within; columella and outer lip much twisted together, forming a broad, rather deep, reflexed sinus at base.

Length 0.90 inch (23 millim.). Diam. 0.30 inch (7½ millim.).
Length of aperture 0.30 inch (7½ millim.).
Breadth of do. 0.16 inch (4 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—A fine symmetrical species, which seems to have no affinities so close as to be easily confounded with any other. Its most prominent characters, perhaps, are the nearly uniform diameter of the two or three lower whorls, while above these the spire curves more rapidly to the rather acute apex, and the dark purple aperture. These two points will readily serve to distinguish it.

4. **Melania iota.**

Plate II. Fig. 4.

T. conicâ, glabrâ, corneo-virente; spirâ acutâ, elevatâ; anfr. 10, superioribus carinatis, inferioribus convexis; suturis impressis; aperturâ elongato-ovatâ, intùs albidâ; columellâ roseâ, incurvâ, in sinum angustum productâ.

Shell conical, smooth, greenish horn-colored; spire acutely elevated; whorls about 10, lower ones convex, upper whorls with a strong carina below the middle; sutures impressed; aperture pyriform, small, within whitish; columella but little rounded, not indented, sinus very small.

Length 0.78 inch (20 millim.). Diam. 0.25 (6 millim.).
Length of aperture 0.26 inch (7 millim.).
Breadth of do. 0.15 inch (4 millim.).

Habitat. ———.

5. Melania altipeta.

Plate II. Fig. *5, a, b.*

conicâ, glabrâ, subcrassâ, corneâ; spirâ elevatâ; anfr. 10, con-
superioribus carinatis, vel modo striatis, ultimo 1–2-fasciato;
â distinctè impressis; aperturâ parvâ, ovatâ, intùs fasciatâ; colu-
incurvâ, in sinum effusum productâ.

ell conical, smooth, horn-colored, thick; spire elevated;
ls about 10, small, convex, the upper ones carinate, or
striate; sutures distinctly impressed; aperture small,
ical, banded within; a small but distinct sinus, with an
termination at base.
ngth 0.62 inch (16 millim.). Diam. 0.24 inch (6 millim.).
ngth of aperture 0.21 inch (5 millim.).
eadth of do. 0.10 inch (2½ millim.).

bitat.—Racoon Creek, Vinton county, Ohio.
cabinet.

s.—A very graceful, rather slender species, with somewhat
club-shaped form by its bulbous body whorl. Two speci-
only are before me; one has a narrow band at the base
e body whorl, the other has an additional band on the
ltimate, faintly indicated also on the upper whorls of the

may be compared with *M. conica Say*, but is much more
ted, the whorls are more narrow and crowded, as well as
numerous than in that species, and the aperture much
er, being only about one-fourth the length of the shell.
om *M. neglecta* it differs by its more slender form, smaller
nore condensed whorls, and by its entirely different aper-
The apicial whorls seem to be slightly folded.

6. **Melania latitans.**

Plate II. Fig. 6.

T. conicâ, tenui, fulvo-virente; spirâ elevatâ; anfr. 8–9, convexis, vel subangulatis, transversò rudè striatis, striis spiralibus impressis, infernè obsoletioribus, fasciisque obscuris cinctis; aperturâ rotundo-ovatâ, intùs rubescente et purpureo fasciatâ; labro sinuoso; columellâ incurvâ, purpureâ, in sinum latum productâ.

Shell conical, obscurely striate, greenish brown, rather thin; spire elevated; whorls 8–9, convex or subangulated, with three or four obscure transverse striæ above the angle, which become obsolete below it, and one or two brown bands at and above the middle of each turn; sutures distinct; lines of growth coarse, amounting almost to ribs on the lower whorls; aperture not large, sub-rotund or very broad ovate, reddish within, and banded; columella very much curved and twisted, with a small sinus at base.

Length 1 inch (26 millim.). Diam. 0.39 inch (10 millim.).

Length of aperture 0.34 inch (9 millim.).

7. Melania vittata.

Plate II. Fig. 7.

T. conicâ, subglabrâ, fusco-virente; spirâ elevatâ; anfr. 9, planis, lineis duabus fuscis ornatis, quarum inferior in angulum prope suturam revolvit, lineis in anfr. supremis obsoletis, in ultimo 4 vel 5 conspicuis; suturis valdè impressis; aperturâ ovatâ, intùs albidâ, fusco quadrilineatâ; columellâ incurvâ, in sinum tenuem productâ.

Shell conic, nearly smooth; spire elevated; whorls about 9, flat, with two fine, distant, brown lines on each, the lower one revolving upon an angle near the suture; lines obsolete on the extreme upper whorls, and increased to four or five on the body whorl, visible also within the aperture; sutures deeply impressed; aperture ovate, within whitish, but exhibiting also the brown lines of the epidermis; columella curved, sinus inconspicuous.

Length 0.86 inch (22 millim.). Diam. 0.32 inch (8 millim.).

Length of aperture 0.33 inch (8 millim.).

Breadth of do. 0.16 inch (4 millim.).

Habitat.—Alabama.

My cabinet. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M. D.

Obs.—May be compared with *M. Taitana Lea*, but may be distinguished by its flat, subangulated whorls. It also exhibits somewhat coarse striæ (amounting nearly, if not quite, to ribs in some specimens) upon all the whorls, even the body whorl is no exception. The sutures are also deeply impressed, the contiguous whorls shelving towards each other to form quite a furrow there. Upper whorls carinate.

It is a very beautiful species, the distinct, reddish brown, hair-like bands contrasting finely with the yellowish brown color of the general shell.

8. **Melania nigrocincta.**

Plate II. Fig. 8.

T. conicâ, glabrâ, tenui, fuscâ; spirâ modicè elevatâ: anfr. 6, superioribus bifasciatis et supra suturam subangulatis, ultimo convexo, nigro-4-fasciatâ; suturis impressis; aperturâ ovatâ, intùs fasciatâ; columellâ lineari, parùm incurvâ, purpureâ, in sinum parvum productâ.

Shell conical, smooth, not much or acutely elevated; thin, brown, whorls about 6, sub-convex, often slightly angulated near the suture below: sutures impressed; body whorl not large, a little angulated, ornamented with four very dark bands, the upper and lower of which are distant, and the central ones approximate or confluent: aperture somewhat large, elliptical, banded within; columella regularly, but not remarkably curved or indented, with a small sinus.

Length 0.58 inch (15 millim.). Diam. 0.27 inch (7 millim.). Length of aperture 0.27 inch (7 millim.).

9. **Melania subangulata.**

Plate II. Fig. 9.

Testâ conicâ, glabrâ, subcrassâ, fusco-virente; spirâ obtusè elevatâ; anfr. 6, convexis, superioribus bifasciatis, infrà sub-angulatis, ultimo 6-fasciato, fasciis mediis sæpe confluentibus; suturis valdè impressis; aperturâ oblongo-ovatâ, intùs rubente, fasciatâ; columellâ incurvâ, purpurascente sinum vix formante.

Shell conical, smooth, rather thick; spire obtusely elevated; whorls about 6, convex, sub-angulated below the middle, brown banded; sutures deeply impressed, and situated in a deep furrow formed by the inclination of two whorls towards each other at that part; lower band below the angulation, upper one midway between it and the suture above; body less angulated, with about six reddish-brown bands, the upper and lower of which are distinct and distant, the central ones confluent, more distinct in the interior; aperture small, long-ovate, within reddish and banded; columella regularly curved, purplish, no sinus at base.

Length 0.62 inch (17 millim.). Diam. 0.30 inch (7½ millim.).
Length of aperture 0.30 inch (7½ millim.).
Breadth of do. 0.17 inch (4 millim.).

Habitat.—Alabama.
My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—Somewhat allied to *M. rufescens Lea*, in general form, but that species has regularly convex whorls and no bands, and has at least two more whorls. The number of whorls in this species cannot, however, with certainty be determined, since in all my specimens, seventy or eighty in number, every one is decollate, but the form does not indicate the loss of more than two whorls at most, and only four are present. *M. ru* *fescens* is described as having eight. A few of the specimens are irregularly and strongly striate on the body whorl.

10. **Melania brunnea.**

Plate II. Fig. 10.

T. conico-ovatâ, glabrâ, tenui, fusco-virente; spirâ obtusè elevatâ; anfr. 6, superioribus, subplanis, ultimo convexo, interdum trifasciato; suturis impressis; aperturâ magnâ, ovatâ, intùs albido-rubescente; columellâ incurvâ, sinum vix formante.

Shell elongate-ovate, smooth, thin, brown; spire obtusely elevated; whorls six, nearly flat; body whorl convex, sometimes three-banded; sutures irregularly but decidedly impressed; aperture large, broad-elliptical, within whitish, or tinted with reddish; columella somewhat indented below the middle, and forming a very small sinus at base.

Length 0.76 inch (20 millim.). Diam. 0.32 inch (8 millim.)
Length of aperture 0.37 inch (9 millim.).
Breadth of do. 0.23 inch (6 millim.).

Habitat.—Alabama.

My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

11. **Melania virens.**

Plate II. Fig. 11.

T. ovato-conicâ, glabrâ, subcrassâ, virente; spirâ obtusè elevatâ, decollatâ; anfr. superstitibus 5, convexis, ultimo amplo; suturis valdè impressis; aperturâ ovatâ, magnâ, albido-cœrulescente; columellâ incurvâ, subreflexâ, in sinum inconspicuum productâ.

Shell ovate-conic, smooth, rather thick, spire rather obtusely elevated, with a somewhat convex outline, and with sutures decidedly impressed; color light uniform green, paler towards the summit; whorls, five only remaining, and indications of one lost by truncation, convex; aperture rather large, elliptical, bluish within; columella well rounded, not perceptibly indented, and with a small recurved sinus at base.

Length 0.87 inch (22 millim.). Diam. 0.40 inch (10 millim.).
Length of aperture 0.42 inch (10 millim.).
Breadth of do. 0.21 inch (5 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—A broad species with an outline and proportions not unlike a *Paludina*, to which genus its pale uniform green color also seems to ally it. I am not sure that it should not be referred to that genus. It cannot be compared with any known species.

12. **Melania ampla.**

Plate II. Fig. 12.

T. ovato-conicâ, glabrâ, tenui, fulvo-virente; spirâ obtusè elevatâ; anfr. 5–6, subconvexis, superioribus viridi unifasciatis, ultimo amplo,

convexo, viridi 4-fasciato; suturis irregulariter profundè impressis; aperturâ magnâ, ovatâ, intùs rubescente, purpureo-fasciatâ; columellâ parùm incurvâ, subfoveatâ, infernè subeffusâ.

Shell ovate-conic, smooth, thin; spire obtusely elevated; whorls 5–6, sub-convex; body whorl ample, surrounded with four dark greenish bands; sutures irregularly and deeply impressed; aperture large, ovate, within roseate and banded; columella rounded, slightly indented, and a little effuse at base.

Length 1.25 inch (32 millim.). Diam. 0.58 inch (15 millim.).
Length of aperture 0.58 inch (15 millim.).
Breadth of do. 0.30 inch (8 millim.)

Habitat.—Alabama.
My cabinet.

Obs.—Compared with *M. olivula Con.*, it is a larger, much less solid species, the epidermis is thinner, less polished, and has not the finely contrasting colors which render *M. olivula* so lively and pleasing; differs from *M. fuliginosa Lea* in being far less ponderous, with fewer and less distinct bands, by the dis-

magnâ, elongato-ovatâ, intus rubescente; columellâ subfoveatâ, sinum vix formante.

Shell ovate, rather thin; smooth, chocolate-colored; spire obtusely elevated; whorls about 6, sub-convex; body whorl large, substriate; sutures moderately impressed; aperture large, narrow ovate, reddish within; columella indented, with a broad, not very remarkable sinus at base.

Length 1 inch (26 millim.). Diam. 0.48 inch (12 millim.).
Length of aperture 0.48 inch (12 millim.).
Breadth of do. 0.23 inch (6 millim.).

Habitat.—Alabama.
My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—In form not unlike *M. olivula Con.*, but its very peculiar plain, dark, chocolate-colored epidermis and sombre interior will at once distinguish it from all other species. A few irregular striæ are visible on the body whorl, and a very obscure narrow band may be observed near the sutures; in all of the three specimens before me the columella is slightly reflected over a narrow umbilical opening near the base, which appears almost disconnected from the outer lip as in *Achatina.* The burnt appearance of the shell has suggested its specific name.

14. Melania arachnoidea.

Plate II. Fig. 14.

T. conicâ, tenui, fusco-corneâ; spirâ gracili, elevatâ; anfr. 12, plicis transversis et liris spiralibus decussatis, lirâ centrali in carinam elevatâ, subter quam plicæ evanescunt; suturis valdè impressis; aperturâ parvâ, ovatâ, intùs purpurascente; columellâ incurvâ, in sinum angustum productâ.

Shell conic, rather thin, horn-colored; spire slender and

much elevated; whorls 12, very strongly striated
particularly the upper ones; the ribs extend only
nent, acute carina on each whorl, situated below
between which and the suture below, one or two
alone are visible; sutures deeply impressed; ap
small, ovate, purplish within; columella regula
without indentation, and with but a small, very r
at base.

Length 1 inch (26 millim.). Diam. 0.28 inch (7
Length of aperture 0.22 inch (5½ millim.).
Breadth of do. 0.15 inch (4 millim.).

Habitat.—A small stream emptying into the Ten
near Loudon, Tennessee.

Cab. Lyc. Nat. Hist., N. Y. J. G. Anthony. B

Obs.—This is one of the slenderest and most ele
genus; more than forty specimens are before me,
very constant in all their characters; it comes n
striatula Lea by its folds and striæ, but should not b

15. **Melania eliminata.**

Plate II. Fig. 15.

T. elongato-conicâ, tenui, castaneâ; spirâ gracili, elevatâ; anfr. 8, convexis transversè plicatis et spiraliter striatis, plicis striisque in anfr. inferioribus evanescentibus: suturis impressis; aperturâ parvâ, ovatâ, purpurascente; labro sinuoso; columellâ incurvâ, in sinum angustum productâ.

Shell conic, thin, brownish; spire slender, elevated; whorls about 8, convex, with transverse folds and spiral striæ, both of which, however, disappear towards the lower portion of each whorl, and are hardly visible on the last whorl; sutures deeply impressed; aperture small, ovate, within translucent, exhibiting the exterior coloring through its substance; columella but little rounded except near its base, where with the much curved lip it forms a sharp, narrow sinus.

Length 0.80 inch (21 millim.). Diam. 0.24 inch (6 millim.).
Length of aperture 0.26 inch (7 millim.).
Breadth of do. 0.15 inch (4 millim.).

Habitat.—Kentucky, near Owenboro'.
My cab. Cab. Lyc. Nat. Hist., N. Y.

Obs.—This is a very slender and elevated species, resembling in this respect *M. comma Con.*, from which it differs very materially by the character of its folds and striæ, which are more decided, being nearly as prominent, though less distant, than in *M. Curryana Lea;* the striæ revolve round the whorls and over the ribs without being interrupted by them; differs from *M. Edgariana Lea*, by its brown color, more slender form, less convex whorls, and thinner texture; it is more slender than *M. decora* or *costulata*, and less acute, the whorls tapering more gradually to the apex; on the upper whorls there are about five striæ, the lowest of which is much more elevated than the others, and the folds are arrested by it near the suture. The penultimate whorl is often sub-angulated at its base.

16. **Melania baculum.**

Plate II. Fig. 16.

T. elongato-conicâ, crassâ, fulvo-castaneâ; spirâ perelevatâ, decollatâ; anfr. superst. 8, subplanis, plicis transversis striisque spiralibus decussatis, quæ in anfr. inferioribus obsolescunt; suturis impressis, flavescentibus; aperturâ ovatâ, intùs purpurascente; columellâ incurvâ, foveatâ, in sinum tenuem productâ.

Shell conical, thick; of a dull, reddish-brown color, with a lighter shade near the upper part of each whorl. Spire much elevated, not diminishing rapidly as it ascends, and with nearly a rectilinear outline; whorls 8 remaining, and with an appearance of having lost several by truncation; hardly convex and with a deeply impressed suture; aperture small, broadly ovate, light red within; columella rounded, indented, with a small sinus.

17. **Melania incrassata.**

Plate II. Fig. 17.

onicâ, glabrâ, crassâ; spirâ elevatâ; anfr. 8–9, perconvexis, vix
latis, ultimo spiraliter striato, in medio constricto; suturis valdè
sis; aperturâ ovatâ, intùs rubescente; columellâ reflexâ, in sinum
dum productâ.

ll conical, smooth, thick; spire elevated; whorls 8–9,
onvex, somewhat bi-angulated; sutures deeply impressed;
whorl striated, with a constriction about the middle, which
xtends to the penultimate whorl; aperture ovate, within
h; columella not indented, reflected, sinus deep.
gth 1.12 inch (29 millim.). Diam. 0.45 inch (12 millim.).
gth of aperture 0.37 inch (9 millim.).
adth of do. 0.18 inch (4½ millim.).

bitat. ———.
cabinet.

s.—Only one specimen has come under my notice, which,
ver, is so unlike any other that I cannot hesitate to con-
it new.
is a thick, ponderous species, with narrow, convex or bi-
lated whorls, faintly banded on the angulations.

18. **Melania excavata.**

Plate II. Fig. 18.

vato-conicâ, glabrâ, crassâ, castaneâ; spirâ obtusè elevatâ, decol-
anfr. superst. 3–4, planis vel subconcavis, ultimo in medio suban-
, suprà angulum subexcavato, striis incrementi rudibus; suturis
ctis; aperturâ ovatâ, sursùm subcanaliculatâ, intùs rubescente;
ellâ incurvâ, reflexâ, sinum non formante.

Shell ovate-conic, smooth, olivaceous, thick; spire obtus elevated, decollate; whorls 3–4, remaining flat or concav sutures distinct; penultimate and body whorl with a bro deep, concave excavation, their edges being elevated into obtuse carina, tipped with a lighter color; lines of growth ve strong; aperture not large, ovate, reddish within; colume regularly curved, thickened by a deposit of calcareous matt purplish and white, indented near its base, without any sinus

Length (of an eroded example) 0.84 inch (21 millim.).
Diam. (do. do.) 0.44 inch (11 millim.).
Length of aperture 0.40 inch (10 millim.).
Breadth of do. 0.22 inch (5½ millim.).

Habitat.—Alabama.
My cabinet.

Obs.—An unadorned species of a dull olive color, not eas confounded with any of its congeners. Differs from *M. fi formis Lea* by its broad, more elevated spire, its purple mou unadorned with bands, but above all, by the peculiar exca tion on the lower whorls, which is so peculiar as to distingu below the middle, of which the lower three also revolve within the aperture, on the columella; aperture small, elliptical, within whitish, subnacreous; columella not indented, sinus small.

Length 0.75 inch (19 millim.). Diam. 0.30 inch (8 millim.).
Length of aperture 0.33 inch (8 millim.).
Breadth of do. 0.17 inch (4 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—A singularly pale, greenish-white species, the distinguishing marks of which are, its regular, subcylindric form, and the smooth spire, combined with the prominent striæ at the base of the shell. These are characters which I do not recognise on any other species so combined. There is also a distinct carina on the penultimate whorl, near the top of the aperture, above which may be observed a faint interrupted line.

20. **Melania textilosa.**

Plate II. Fig. 20.

T. conicâ, crassâ, stramineâ; spirâ parùm elevatâ; anfr. 7–8, obscurè liratis et subnodosis, superioribus subplanis, ultimo subconvexo, infra medium glabro; suturis impressis; aperturâ ovatâ, roseo-albidâ; columellâ incurvâ, reflexâ, in sinum tenuem productâ.

Shell conical, thick; color uniform, pale greenish yellow; spire not acutely elevated; whorls 7–8, nearly flat, obscurely striate and sub-nodulous; body whorl coarsely, but not thickly striate on its upper half; sutures impressed; aperture rather large, ovate, whitish, inclining to roseate.

Length 0.88 inch (23 millim.). Diam. 0.40 inch (10 millim.).
Length of aperture 0.39 inch (10 millim.).
Breadth of do. 0.20 inch (5 millim.).

Habitat.—Georgia.
My cabinet.

Obs.—In form, like *M. Duttoniana Lea*, but without any the ornamental decorations of that species. The nodules are so distinct, appearing more like interrupted folds. The st on the body whorl are not uniformly distributed, but about middle there is a plain surface or ground, which becomes m decidedly a furrow on the penultimate whorl.

21. **Melania curvilabris.**

Plate III. Fig. 1, *a*, *b*.

T. conicâ, subcrassâ, corneo-virente; spirâ elevatâ; anfr. 7–8, conv subangulatis, ultimo utrinque angulato, in medio latè constricto; sut irregulariter valdè impressis; aperturâ irregulari, intùs albidâ; l profundè retrorsùm sinuato; columellâ valdè incurvâ, subfoveatâ sinum profundum productâ.

Shell conical, smooth, rather thick, greenish horn-color; sp elevated; whorls 7–8, convex or subangulated; body wh angulated, with a depression broad but not deep; sut deeply and irregularly impressed; aperture very irregular,

22. Melania elegantula.

Plate III. Fig. 2.

T. ovato-conicâ, glabrâ, viridulâ; spirâ brevi; anfr. 5–6, humerosis, superioribus suprà suturam nigro-unifasciatis, ultimo subcylindrico, fasciis fuscis 2 vel 3 cincto; suturis inconspicuis; aperturâ elongato-ovatâ, intùs fasciatâ; labro subsinuato; columellâ incurvâ, in sinum tenuem productâ.

Shell obtusely conical, smooth; whorls 5–6, irregularly shouldered and angulated; body whorl dark olive-green color, with two or three darker bands, which are visible also within the aperture; upper whorls of a very light green color, with *one* light brown sub-central band, and *another* so near the upper part of the whorl as to be almost concealed by the suture; sutures rather obscure; aperture rather large, irregularly ovate; columella much indented near its base, outer lip sinuous.

Length 0.60 inch (15 millim.). Diam. 0.25 inch (6 millim.).
Length of aperture 0.28 inch (7 millim.).
Breadth of do. 0.16 inch (4 millim.).

Habitat.—Kentucky.

My cabinet. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M. D.

Obs.—A singularly ornamented species, of which only two specimens are before me, and which cannot be compared with any described species. The apex is eroded in the specimens under observation, and only five whorls are visible, but it evidently has one more when perfect. The whorls form a shelving shoulder from the suture, and are then nearly flat, the body whorl being, perhaps, slightly concave. Altogether it presents a remarkable and beautiful appearance, and no one need be at a loss to recognise it after once having seen a specimen. Three bands are visible in the interior.

23. **Melania pupoidea.**

Plate III. Fig. 3.

T. ovato-conicâ, glabrâ, crassâ, stramineo-virente; spirâ obtusè elevatâ; anfr. 7, subconvexis, gradatis, superioribus fusco-unifasciatis; ultimo 4-lineato; suturis valdè impressis; aperturâ elongato-ovatâ, intùs albidâ, fasciatâ; labro sinuoso, columellâ rotundatâ, in sinum tenuem productâ.

Shell ovate-conic, smooth, rather thick; spire obtusely elevated, with a decidedly convex outline, and a well impressed suture; whorls 7, convex, nearly entire at the apex; color pale green, with one linear band revolving on the spire, and four broader and more distinct bands on the body whorl; aperture small, narrow-ovate, diaphanous, with four distinct brown bands within; columella rounded, not indented; outer lip curved and extended forward; sinus small.

Length 0.87 inch (22 millim.). Diam. 0.35 inch (9 millim.).

24. **Melania tecta.**

Plate III. Fig. 4.

T. conicâ, tenui, nigro-fuscâ; spirâ elevatâ; anfr. 7–8, planis, suprà suturas carinatis; suturis valdè impressis; aperturâ ovatâ, intùs purpurascente et obscurè fasciatâ; columellâ incurvâ, in sinum tenuem productâ.

Shell conical, thin, brown; spire elevated; whorls 7–8, flat, with a distinct, but not elevated carina on each at its lower edge, near the suture; sutures very deeply impressed; aperture oval, within reddish and lightly banded; columella curved, sinus small.

Length 0.60 inch (15 millim.) Diam. 0.26 inch (6½ millim.).
Length of aperture 0.23 inch (6 millim.).
Breadth of do. 0.14 inch (3½ millim.).

Habitat.—Ohio.
My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—May be compared with *M. pulchella Anth.*, but is readily distinguishable by its more slender proportions, thinner texture, lighter color, and above all by its peculiarly shaped whorls, which, increasing regularly, and being carinate at their bases, have somewhat the appearance of the roof of a house, hence its name. Lines of growth distinct; one or two indistinct, narrow bands are often visible on the shell; a very neat and graceful species.

25. **Melania imbricata.**

Plate III. Fig. 5.

T. conicâ, glabrâ, subcrassâ, corneâ; spirâ elevatâ; anfr. 8–9, supe-

rioribus planis, utrinque angulatis, ultimo subconvexo, indistinctè biangulato; suturis valdè impressis; aperturâ elongato-ovatâ, intùs albidâ, columellâ incurvâ, in sinum tenuem productâ.

Shell conical, nearly smooth, rather thick, light horn-colored; spire elevated, but not acutely so; whorls 8–9, flat; lines of growth distinct, having almost the appearance of ribs; two lines, distant, slightly visible, surround each whorl, and from these the whorls incline towards each other to form a broad groove between them; sutures well impressed; aperture small, narrow ovate, within whitish; columella much indented and curved, forming a slight sinus at base.

Length 0.88 inch (23 millim.). Diam. 0.30 inch (8 millim.).
Length of aperture 0.33 inch (8 millim.).
Breadth of do. 0.21 inch (5 millim.).

Habitat.—Alabama.
My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—A fine symmetrical shell, some of its varieties approaching *M. sordida Lea* in form, but differing in every other respect. The whorls enlarge regularly, and the lower raised

Shell conical, thin, brownish-olive; spire obtusely elevated; whorls 7–8, smooth; the upper ones are surrounded by a sharp elevated keel just above the suture; the body whorl is angulated in the middle by two keels, of which the upper is the more prominent; sutures deeply impressed; aperture ovate, ending in an acute angle below, whitish within; columella rounded, produced into a narrow but slight sinus.

Length 0.50 inch (13 millim.). Diam. 0.28 inch (7 millim.).
Length of aperture 0.26 inch (7 millim.).
Breadth of do. 0.14 inch (3½ millim.).

Habitat.—Battle creek, Tennessee.
My cab. Cab. Lyc. Nat. Hist., N. Y.

Obs.—Bears some resemblance to *M. acuto-carinata Lea*, but differs from it in many particulars. It is of a much lighter color, has the carina on every whorl, the body whorl not excepted, its columella is not remarkably indented as in that species, and it is altogether a thinner and broader shell. The aperture is generally uncolored, but some specimens present a faint tinge of violet there.

27. **Melania eximia.**

Plate III. Fig. 7.

Testâ conico-ovatâ, liratâ, corneo-virente; spirâ parùm elevatâ; anfr. 8—9; superioribus carinâ acutâ angulatis et fasciâ nigrâ cinctis, ultimo liris 4 et fasciis duabus cincto; suturis inconspicuis; aperturâ elongato-ovatâ, intùs corneâ, bifasciatâ; labro valdè sinuoso; columellâ rectâ, in sinum profundum productâ.

Shell deeply sulcate and carinate, ovate; of a beautiful light apple-green color, ornamented with two dark-green bands, and an elevated, prominent carina of a light color revolving between them; spire not remarkably elevated, but acute, of a rather convex outline; whorls 8–9, somewhat convex, and with sutures not prominent, but channelled; body whorl with about four carinæ, the lowest one being indistinct; aperture small, sub-rhomboidal, with two bands in the interior, distant from each other and from the edge of the outer lip; outer lip much twisted, auger-like, causing the sinus, which is small, to curve backwards.

Length 0.60 inch (15 millim.). Diam. 0.28 inch (7 millim.).
Length of aperture 0.25 inch (6 millim.).
Breadth of do. 0.13 inch (3 millim.).

Habitat.—Tennessee.
My cabinet.

Obs.—A beautiful little shell, of a singularly bright, lively appearance; the colors are well contrasted, very distinct, and the prominent carinæ add to the general effect. On the upper whorls, but one band is visible, the lower one being concealed, or nearly so, by the revolutions of the spire. It cannot well be compared with any other species.

sutures not remarkable; body whorl with a strong, well developed carina extending from the upper part of the aperture, and revolving round so as to be at its centre when it reaches the mouth again. The carina, and a smaller one below it, are indicated in the interior by a grooved channel with a dark band running through it. Aperture rhomboidal, banded within. Columella straight, with an acute sinus at base.

Length 0.50 inch (13 millim.). Diam. 0.34 inch (9 millim.).
Length of aperture 0.30 inch (8 millim.).
Breadth of do. 0.16 inch (4 millim.).

Habitat.—Alabama.

Obs.—Only one specimen of this remarkable species has come under my notice, but it is so widely different from all others that no one can for a moment doubt its distinctive character. The upper whorls are obscurely banded near the suture.

29. Melania proscissa.

Plate III. Fig. 9.

T. rotundo-ovatâ, subcrassâ, fuscâ; spirâ brevi; anfr. 5 ? convexis, superioribus bicarinatis, ultimo carinis acutis 4 vel 5 cincto; suturis linearibus; aperturâ ovatâ, intùs 5-lineatâ; columellâ incurvâ, foveatâ, purpureo tinctâ, in sinum tenuem productâ.

Shell ovate, rather thick, brown; whorls supposed to be about 5, rather convex; body whorl surrounded by about 5 carinæ, of which two central ones are more prominent; sutures linear; aperture large, ovate, exhibiting the elevated ridges on the body whorl, as linear, brown bands seen through the substance of the shell; columella rounded, deeply indented, having a small purple spot below the middle, with a slight sinus at base.

Length 0.56 inch (14 millim.). Diam. 0.35 inch (9 millim.).
Length of aperture 0.28 inch (7 millim.).
Breadth of do. 0.18 inch (4½ millim.).

Habitat.—Alabama.
My cabinet.

Obs.—The only specimen I have is somewhat mutilated, bu seems nevertheless perfectly distinct; the only known specie with which I can compare it is *M. sulcosa Lea*, which is a muc thinner and more elevated species. The aperture of the present shell is also proportionally much larger, and the numbe of whorls less, for, though injured in that part, the rapid diminution of the whorls does not indicate an elevated spire; the number of raised lines on the body whorl is also less, and they are rather very elevated *costæ* than *striæ* as in Mr. Lea's species.

30. **Melania torulosa.**

Plate III. Fig. 10.

Obs.—But a single specimen of this species is before me, but it differs so much from all others that I cannot hesitate to place it among well established species. *M. acuto-carinata Lea* is the only one with which it may be compared, but that species has the carina obsolete on the body whorl, the very point where it is most remarkably developed in this; the whorls also in the *M. torulosa* diminish much more rapidly to an acute apex, which in *M. acuto-carinata* is said to be *obtusely* elevated; the *M. torulosa* is remarkable for its acute elevation from the broad base of the carina on the body whorl. In the columella too of the present species there is no indentation, while in *M. acuto-carinata* it is "remarkably indented."

31. **Melania planogyra.**

Plate III. Fig. 11.

T. elongato-conicâ, subglabrâ, crassâ, fusco-virente; spirâ valdè autem obtusè elevatâ; anfr. 10–11, subconcavis, costâ suprà suturam decurrente marginatis, et fasciâ fuscâ juxtà costam ornatis; anfr. ultimo fasciâ alterâ infrà angulum decurrente; suturis impressis; aperturâ parvâ, rhomboideâ, intùs bifasciatâ; labro valdè sinuoso; columellâ rectâ, in sinum latum productâ.

Shell conical, rather smooth, thick; of a dull, dark, horn-color, unrelieved by any other except a rather indistinct, brown band, revolving near the base of each whorl, immediately below which a raised, rounded, subcrenulated ridge revolves between it and the suture below; spire much, but not acutely, elevated, with a nearly rectilinear outline; whorls 10–11, flat or concave, and with a well impressed, channelled suture; aperture small, rhomboidal, diaphanous, exhibiting the dark band of the exterior through its substance very faintly, far within. Columella deeply curved, not indented, thickened at base; outer lip angularly curved, extended forwards; sinus rather broad, not deep.

Length 1.37 inch (34 millim.). Diam. 0.46 inch (12 millim.)
Length of aperture 0.40 inch (10 millim.).
Breadth of do. 0.24 inch (6 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—A stout species, which most resembles ***M. regularis*** *Lea* in general appearance, from which, however, its concave whorls, elevated carina, and dark band will readily distinguish it. It has not the channelled body whorl of ***M. canaliculata*** *Say*, nor the convex, subangulated upper whorls which distinguish that species.

The lines of growth are very coarse and prominent, and extending over the raised line near the base of the whorls, give the latter an interrupted or subcrenulated appearance.

32. **Melania gradata.**

outer lip much bent forward towards the base; columella straight, produced into a narrow deep sinus, which is slightly recurved.

Length 0.85 inch (22 millim.). Diam. 0.42 inch (11 millim.).
Length of aperture 0.30 inch (8 millim).
Breadth of do. 0.20 inch (5 millim.).

Habitat.—Alabama.
My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—Belongs to the group of which *M. canaliculata* may be considered the type. It is, however, much less elevated than *M. canaliculata*, has not the conspicuous grooving on the body whorl as in that species, and its spire has the whorls flat instead of exhibiting an obtuse carina, as described by Mr. Say; a sharp elevated carina at the base of the whorls closely overlies the suture beneath; the extreme upper whorls having this more distant from the suture become distinctly carinated. The regular gradation of the whorls is its most distinctive character.

33. Melania fastigiata.

Plate III. Fig. 18.

T. conicâ, glabrâ, crassâ, virente; spirâ elevatâ, acutâ; anfr. 9–10, primùm subcarinatis, deindè planis, fusco-bifasciatis, ultimo trifasciato, in medio carinâ angulato; suturis impressis, aperturâ rhomboideâ, intùs albidâ, fasciatâ; labro valdè sinuato, columellâ rectâ, in sinum profundum productâ.

Shell conical, smooth, moderately thick; of a pale yellowish-green color, ornamented with two distinct, distant, reddish-brown bands on each whorl, except those near the apex, which are carinate; spire elevated, rising from the broad body whorl with regularly decreasing volume in a pyramidal form to the acute apex; whorls 10, not convex, with rather indistinct sutures in a furrowed channel; lines of growth curved and strong, particularly on the penult and body whorl, where they are almost folds; body whorl distinctly carinated, having one carina at the middle, another a short distance below, with a broad band immediately above the carinæ, and another far down, near the base. Aperture small, sub-rhomboidal, whitish within, three bands visible in the interior; columella nearly straight, a little thickened, outer lip very much curved, auger-like; sinus narrow, recurved.

Length 0.80 inch (20 millim.). Diam. 0.38 inch (10 millim.).
Length of aperture 0.32 inch (8 millim.).
Breadth of do. 0.16 inch (4 millim.).

Habitat.—Tennessee.

Obs.—A fine symmetrical species, which is, perhaps, most nearly allied to *M. vestita Con.;* from that shell it differs in being less ponderous, more acute in its outline, and in its flat whorls, the *M. vestita* being angulated below the middle; it has also a double band, while "*vestita*" has a single one. From *M. elevata Say* it differs by its less slender outline, its want of

Shell conical, smooth, rather thick, yellowish-brown; spire short; whorls 6, upper ones subconvex, with a brown band immediately above the suture, body whorl a little shouldered beneath the suture, and angulated in the middle, surrounded by two narrow bands, one above and the other below the angle; sutures impressed; aperture ovate, banded within, columella much curved, with hardly a perceptible sinus at base.

Length 0.45 inch (11 millim.). Diam. 0.21 inch (5 millim.).
Length of aperture 0.20 inch (5 millim.).
Breadth of do. 0.12 inch (3 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—A small, not inelegant species, which may be compared with *M. ovoidea Lea* and *M. depygis Say*, as its nearest congeners. The former species I have never seen, but judging from the description this differs from it in many particulars; its form is proportionately broader, the bands are more distinct, the body whorl has a distinct angle, which is also apparent on the penultimate whorl, amounting there to a carination. The aperture is also much smaller. The same particulars apply with equal force to *Melania depygis Say*, the two being so nearly alike in description that the *M. ovoidea* may prove to be only a variety of Mr. Say's *depygis*.

35. **Melania pallidula.**

Plate III. Fig. 15.

T. ovato-conicâ, glabrâ, subcrassâ, stramineâ; spirâ obtusè elevatâ, decollatâ; anfr. superstit. 4, superioribus subplanis, ultimo angulato, obscurè fusco-bilineato; suturis impressis; aperturâ ovatâ, intùs albidâ, bilineatâ; columellâ incurvâ, sinum vix formante.

Shell elongate-ovate, smooth, moderately thick; of a pale horn-color, with a faint, brown, narrow band on the penult whorl, increased to two on the body whorl, and obsolete on the apicial ones; spire obtusely elevated, with a rather convex outline and a well defined suture; whorls, four remaining, with indications of two more lost by truncation, body whorl angulate, and rather coarsely striate longitudinally; aperture rather large, ovate, pale within, ornamented with the two bands of the body whorl, which do not reach the outer edge, a broad, plain area intervening; columella curved, with a very slight sinus at base.

Length 0.50 inch (12 millim.). Diam. 0.25 inch (6 millim.).
Length of aperture 0.27 inch (7 millim.).
Breadth of do. 0.15 inch (4 millim.).

Habitat.—Tennessee.
My cabinet.

Obs.—This is a very neat, pretty species, whose affinity with any other is not so strong as to endanger its being easily confounded; from *M. angulata nobis*, it differs in being broader, tinctly striate; body whorl angulated about the middle, nearly smooth, except as modified by the lines of growth, which are quite distinct, the concentric striæ being nearly obsolete on the body whorl; sutures inconspicuous; aperture rather large, ovate, whitish within; columella very slightly rounded, with little or no sinus.

Length 0.43 inch (11 millim.). Diam. 0.22 inch (5½ millim.).
Length of aperture 0.20 inch (5 millim.).
Breadth of do. 0.12 inch (3 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—This cannot well be confounded with any known species; its short spire, flat striated whorls, regularly and rapidly decreasing to the apex, the prominent, acute carina which encircles it near the top of the aperture, beneath which the striæ, so prominent above, are hardly discernible, and its rather broad form, will readily distinguish it from *M. striatula Lea*, to which it might seem allied by form and color; it has somewhat the form of *M. vicina nobis*, but that shell is more slender, less distinctly carinated, and has not the striation of the present species.

37. **Melania angulata.**

Plate III. Fig. 17.

T. conicâ, glabrâ, fulvâ; spirâ acutâ, modicè elevatâ, nigrescente; anfr. 8, superioribus subplanis, carinis duabus, in anfr. penultimo obsolescentibus, cinctis, anfr. ultimo in medio acutè angulato; suturis impressis; aperturâ elongato-ovatâ, intùs albido-rufescente; columellâ subincurvâ, in sinum tenuem productâ.

Shell acutely conic, smooth, brown, rather thick; spire not remarkably elevated, but tapering regularly with a rectilinear outline to the apex, which is entire and acute; whorls 8, nearly flat, upper ones carinate, and with a well defined suture; body whorl with a distinct angle, more distinct where it revolves near the top of the aperture; below this the base is rather concave on the columella side; aperture moderate, narrow, ovate, whitish or faintly tinged with red within; columella slightly curved, not indented; sinus slight, but well defined.

Length 0.56 inch (14 millim.). Diam. 0.25 inch (6 millim.).
Length of aperture 0.25 inch (6 millim.).
Breadth of do. 0.13 inch (3 millim.).

Habitat.—Tennessee.
My cab. Cab. Lyc. Nat. Hist., N. Y.

Obs.—A singularly neat, precise looking shell. Its trim appearance, its pale color, unornamented by any band, and its sharp, well defined angle, amounting almost to a carina, will serve to distinguish it from all others.

beautiful reddish-purple, columella slightly curved, indented, and with a narrow, recurved sinus at base.

Length 0.62 inch (16 millim.). Diam. 0.34 inch (8½ millim.).
Length of aperture 0.31 inch (8 millim.).
Breadth of do. 0.17 inch (4 millim.).

Habitat.—Tennessee.
My cabinet.

Obs.—I know of no species with which this is liable to be confounded; its ample body whorl, the broad, angular, and shelving shoulder on the body and penult whorls, while the upper ones are wanting in this character, and above all the tabulation of the penult whorl, are its most striking characteristics, and will at once distinguish it from all other species; the lines of growth are rather coarse, curved, and approximate.

39. Melania clara.

Plate III. Fig. 19.

T. ovato-conicâ, glabrâ, subcrassâ, stramineo-virente; spirâ parùm elevatâ; anfr. 7, superioribus planis, rapidè crescentibus, purpureo-unifasciatis, ultimo magno, subangulato, quadrifasciato; suturis valdè impressis; aperturâ magnâ, ovatâ, intùs fasciatâ; columellâ subrectâ, in sinum inconspicuum productâ.

Shell ovate, smooth, thick; spire not elevated; whorls 7, flat, nearly smooth; upper ones rapidly enlarging to the body whorl, which is very large, and ornamented with four conspicuous brown bands, on a clear and well contrasting yellow ground; the upper band is distant and alone, near the suture, while the others are crowded and below the middle; sutures impressed; aperture large, ovate, banded inside; columella nearly straight, with no remarkable sinus at base.

Length 0.70 inch (18 millim.). Diam. 0.38 inch (10 millim.).
Length of aperture 0.40 inch (10 millim.).
Breadth of do. 0.20 inch (5 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—Allied to *M. olivula Con.* in general form, but seems to differ by its body whorl, which is sub-angulated at its upper part, near the top of the aperture, and slightly so at the middle; the whorls of the spire have only one band, which is above the middle; lines of growth distinct, giving the upper whorls a slightly varicose character.

40. Melania fusco-cincta.

Plate III. Fig. 20.

T. ovatâ, glabrâ, subcrassâ, stramineo-fuscâ; spirâ brevi; anfr. 4–5, superioribus nigro-unifasciatis, ultimo magno, angulato, fasciis nigris latis duabus unâ suprà et alterâ subter angulum revolventibus; suturis valdè

Habitat.—Alabama.
My cabinet.

Obs.—A short shell, almost like an *Anculosa*; a single specimen only is before me, but is too remarkable to be confounded with any known species.

The uncommonly broad, dark band, surrounded by the generally yellow epidermis, gives it a lively appearance.

41. Melania plena.

Plate III. Fig. 21.

T. oblongo-ovatâ, glabrâ, crassâ, fusco-virescente; spirâ parùm elevatâ, decollatâ; anfr. 4–5, convexis, ultimo magno, in medio subconstricto, fasciis duabus obscuris; suturis irregulariter valdè impressis; aperturâ magnâ, subrhomboideâ, intùs lividâ et fasciatâ; columellâ rectâ, tortâ, foveatâ, in sinum profundum angustum productâ.

Shell oblong ovate, smooth, thick, dark olive-green; spire abruptly decollate, not elevated; whorls 4–5, convex; body whorl large, a little constricted in the centre, having two very faint, distant bands, more distinct in the interior; sutures irregularly and distinctly impressed; aperture large, sub-rhomboidal, within livid and banded; columella strongly indented and twisted, with a strong sinus at base.

Length 0.80 inch (21 millim.). Diam. 0.45 inch (11 millim.).
Length of aperture 0.42 inch (11 millim.).
Breadth of do. 0.20 inch (5 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—A strong, corpulent shell, of a dark, livid color, which cannot well be confounded with any other; its most prominent characters are, its full broad form, the paucity of its whorls, and its strongly indented columella.

42. **Melania compacta.**

Plate III. Fig. 22.

T. ovato-conicâ, glabrâ, crassâ, stramineo-virente; spirâ obtusè elevatâ; anfr. 5, superioribus subplanis, fasciis nigris duabus cinctis quarum inferior suturâ ferè occulta est, ultimo subangulato, trifasciato; suturis impressis; aperturâ ovatâ, intùs albidâ et fasciatâ, columellâ foveatâ, incurvâ, sæpe purpureo-tinctâ, sinum haud formante.

Shell ovate-conic, smooth, thick, yellowish-green; spire obtusely elevated; whorls about 5, nearly flat; body whorl large, subangulated near the base, with three very dark bands, two of which are below the angle; the penultimate whorl has two bands only, and the lowest of these is nearly or quite concealed by the suture, and on the upper whorl the same band is indicated only by a dark, hair-like line; sutures well impressed; aperture rather large, ovate, within whitish and banded; columella strongly indented, base regularly rounded, without any sinus.

shoulder of that species; the bands in the interior are very dark and well defined.

43. Melania glans.

Plate III. Fig. 23.

T. ventricoso-conicâ, glabrâ, crassâ, nigro-fuscâ; spirâ acuminatâ, parùm elevatâ; anfr. 8, convexis, rapidè crescentibus, ultimo magno, perconvexo; suturis distinctis, albo-lineatis; aperturâ elongatâ, intùs purpureâ; columellâ foveatâ, rectâ, in sinum angustum profundum productâ.

Shell ventricose-conic, smooth, thick, dark-olive; spire acuminate, but not elevated; whorls 8, convex, rapidly converging to the apex; body whorl very large, rounded beneath; sutures well defined, white; aperture not large, elliptical, within dark purple; columella indented near the base; sinus well developed.

Length 0.75 inch (19 millim.). Diam. 0.38 inch (10 millim.).
Length of aperture 0.34 inch (9 millim.).
Breadth of do. 0.16 inch (4 millim.).

Habitat.—Tennessee.
My cabinet.

Obs.—A plain, sombre-looking species, with no very remarkable distinguishing characters, except its large, bulbous form, and dark, purple mouth; it cannot well be compared with any other species. The whorls are slightly shouldered, with a very narrow, whitish sutural region.

44. Melania planospira.

Plate III. Fig. 24.

T. rotundo-ovatâ, glabrâ, subcrassâ, corneâ; spirâ brevissimâ; anfr.

**4–5, gradatis, vix elevatis, ultimo permagno, fusco-bilineato; apertu
magnâ, elongato-ovatâ; columellâ incurvâ, in sinum tenuem productâ**

Shell short-ovate, smooth, rather thick, light horn-colore
body whorl large, occupying nearly the entire volume of t
shell; spire nearly flat, consisting of 4–5 perfectly plane whorl
scarcely elevated above the body whorl; aperture long, na
row ovate; columella rounded, ending in a slight sinus.

Length 0.50 inch (13 millim.). Diam. 0.32 inch (8 millim.)
Length of aperture 0.36 inch (9 millim.).
Breadth of do. 0.18 inch (4½ millim.).

Habitat.—Tennessee.

My cabinet. Cab. Lyc. Nat. Hist., N. Y.

Obs.—Cannot be confounded with any other species; i
remarkably flat whorls rising like steps, but little above ea
other, with a distinct and slightly raised rim around the pe
phery, will alone be sufficient to characterize the species.
seems more like an *Anculosa* in form, but is nevertheless a tr
Melania. Two bands are visible on the body whorl and al
within the aperture.

impressed; aperture irregularly ovate; outer lip waved; inside of the aperture whitish or brownish, often with obscure bands; columella rounded, extending into a broad, shallow sinus.

Length 0.66 inch (17 millim.). Diam. 0.38 (10 millim.).
Length of aperture 0.35 inch (9 millim.).
Breadth of do. 0.19 inch (5 millim.).

Habitat.—Nolen river, Kentucky.
My cab. Cab. Lyc. Nat. Hist., N. Y. Cab. B. W. Budd.

Obs.—A somewhat variable species; the remarkably shouldered body whorl will, however, readily distinguish it; differs from *M. obovata Say* by its more distinct spire, its greater proportionate breadth, and by the form of the aperture; it is also much less ponderous; many specimens are obscurely banded on the body whorl, this is more distinctly visible in the young shell.

46. **Melania consanguinea.**

Plate III. Fig. 26.

T. ovatâ, glabrâ, crassâ, fusco-virente; spirâ brevi, acuminatâ; anfr. 8, superioribus subplanis, duobus ultimis humerosis, ultimo permagno, in medio vix constricto; suturis impressis; aperturâ magnâ, ovatâ, intùs lividâ; columellâ incurvâ, purpureo-tinctâ, sinum vix formante.

Shell ovate, smooth, thick, brownish olive; spire short, acuminate; whorls 8, the upper ones nearly flat, the last two or three much shouldered; body whorl very large, slightly constricted in its upper portion, and very faintly banded; sutures deeply impressed; aperture regularly ovate, within livid, approaching to purple far within; columella rounded, with scarcely a perceptible sinus, tinged with purple at base.

Length 0.75 inch (20 millim.). Diam. 0.40 inch (10 millim.).
Length of aperture 0.40 inch (10 millim.).
Breadth of do. 0.20 inch (5 millim.).

Habitat.—Indiana.

My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—Allied to, but perfectly distinct from *M. undosa;* its greater solidity, more elongated spire, and greater number of whorls will at once distinguish it; the whorls of the spire are much more convex, and there is no prominent angle formed by the shoulder on the body whorl as in *M. undosa.*

47. Melania coronilla.

Plate III. Fig. 27.

T. ovatâ, subcrassâ, fusco-corneâ; spirâ brevi; anfr. 5–6, convexis, propè humerum irregulariter nodoso-plicatis, sæpe fusco-unicinctis; suturis valdè impressis; aperturâ ovatâ, intùs rubescente et fasciatâ; columellâ incurvâ, foveatâ, in sinum tenuem productâ.

Shell ovate, moderately thick; of a dark, dull, horn color, sometimes decorated with two or three linear revolving bands at, and below, the upper part of the aperture; spire short, with a rather convex outline to the truncated apex; whorls 5–6, convex, one of which seems to have been lost by truncation;

Obs.—I know no species with which the present one can easily be confounded; its short, rather broad outline, with its thick, prominent, longitudinal ribs on the short whorls of the spire will readily distinguish it. Six specimens only are before me, three of which are banded, and three are plain; the specimens are otherwise very uniform in appearance.

48. **Melania corpulenta.**

Plate III. Fig. 28.

T. ovatâ, glabrâ, fulvo-virente; spirâ brevi, convexo-conicâ; anfr. 6–7, convexis, ultimo subcylindrico, infernè subangulato, fasciis nigris latis duabus cinctis; suturis valdè impressis; aperturâ elongato-ovatâ, supernè angustâ, intùs fasciatâ; columellâ primùm rectâ, deinde in sinum profundum recurvatâ.

Shell ovate, smooth, yellowish, banded; whorls 6–7, convex; body whorl very full, with two distant dark-brown bands quite broad, which are nearly concealed on the upper whorls by the revolutions of the spire; sutures impressed; aperture narrow ovate, broadest at base, banded within; columella much curved below the middle, white, and thickened at base, with a broad and distinct sinus in that region.

Length 0.80 inch (20 millim.). Diam. 0.42 inch (10 millim.).
Length of aperture 0.40 inch (10 millim.).
Breadth of do. 0.17 inch (4 millim.).

Habitat.—Alabama.
My cabinet.

Obs.—Its most prominent character is the corpulence of the body whorl, and its regular oval form. May be compared with *M. bitæniata Con.*, but its body whorl is much more rounded or oval, it is less banded, and the bands are more distinct; the spire is more elevated and less abrupt.

49. Melania neglecta.

Plate III. Fig. 29.

T. conicâ, glabrâ, tenui, stramineâ; spirâ elevatâ; anfr. 10, superioribus subplanis sæpe unifasciatis, lirâ suprà suturam decurrente, in anfr. penultimo obsoletiore; anfr. ultimo subangulato, obscurè bisulcato, sæpè nigro-bifasciato; suturis impressis; aperturâ ovatâ, intùs albido-rosaceâ; labro sinuoso; columellâ subrectâ, tortâ, rosaceâ, in sinum profundum recurvatâ.

Shell conical, rather thin, light yellow; whorls 10, upper ones nearly flat, with a slight ridge revolving just above the suture. This ridge disappears as it approaches the penult whorl, but two of them become visible on the last whorl, which is subangulate. Sometimes the last whorl is encirled by two dark brown bands, of which the uppermost is also visible throughout the upper whorls, covering the ridge above mentioned; sutures impressed; aperture ovate, of a delicate rosy hue within; outer lip waved; columella nearly straight, twisted, roseate, recurved into a deep sinus.

50. Melania gracilior.

Plate I. Fig. 5.

Melania gracilis Anthony (not Lea), Haldeman's Monog. Fresh-Water Shells of North America, Cover of No. 4.

T. conicâ, glabrâ, fusco-nigrescente; spirâ elevatâ; anfr. 8, superioribus planis, ultimo infrà suturam constricto, et fasciâ fulvo-virente cincto; suturis impressis, pallidioribus; aperturâ ovatâ, intùs fasciatâ; labro sinuato; columellâ fuscâ, incurvâ, in sinum distinctum productâ.

Shell conical, smooth, and shining, color dark-brown, texture light; whorls about 8, upper ones nearly flat, the last is usually slightly constricted beneath the suture, and beneath this stricture, on the periphery of the last whorl, revolve one or two broad bands of yellowish-green; sutures impressed, and of paler color than the rest of the shell; aperture small, pyriform, and inwardly ornamented with alternate bands of a dark ruby color and translucent white, which render this part of the shell peculiarly lively and beautiful; outer lip sinuate; columella dark brown, arcuate, and produced into a distinct sinus.

Length 0.75 inch (19 millim.). Diam. 0.28 inch (7 millim.).
Length of aperture 0.25 inch (6 millim.).
Breadth of do. 0.17 inch (4 millim.).

Habitat.—Congress and Springfield Lakes, Stark county, Ohio.

My cab. Cab. Lyc. Nat. Hist., N. Y. B. W. Budd, M.D.

Obs.—This is a very distinct and beautiful species, remarkable for its long slender form, its polished surface, and for a profound stricture on the body whorl of many of the specimens, though this last character is not always present; when it is present, it furnishes a mark by which this species can be readily distinguished from any other.

It is seldom that any of our *Melaniæ* are found inhabiting waters so still as those of the small lakes so numerous in Stark and the neighboring counties in Ohio; nearly all the family are denizens of rapid streams abounding with rocks, to which they adhere, often in great numbers. Occasionally, however, they attach themselves to the dead bivalve shells which pave many of the rivers in our Southern and Western States, or cling to the long grass which grows in them.

This species was first published on the cover of Haldeman's Monograph of the Fresh-Water Shells of North America, No. 4, December 28, 1841. A short time previous Mr. Lea had published a species from Tennessee under the same name, which publication I had not then seen. It becomes expedient, therefore, to change its name to one not preoccupied, and I propose, in re-describing the species, to confer upon it that of "*gracilior*," which seems even *more* appropriate than the name originally given to it.

Shell rhomboidly ovate, covered with an olivaceous-yellowish epidermis, beneath which usually appear two purplish bands encircling the body whorl; spire short; whorls about four, the upper ones much eroded, the upper portion of the last whorl is shouldered by a series of large, obtuse, and irregular tubercles, about four or five in number, there is also a slight tendency towards thickening in the ventral portion of the whorl; aperture ovate, effuse above and below; right lip thin; columellar lip usually stained with purple above and below, reflected so as partially to cover a deep umbilical depression, which, however, is continued towards the base, forming a channel much resembling that of the umbilical region in *Natica.*

Length 0.83 inch (21 millim.). Diam. 0.63 inch (16 millim.).
Length of aperture 0.61 inch (16 millim.).
Breadth of do. 0.31 inch (8 millim.).

Habitat.—Holstein river, near Knoxville, Tenn, where it was collected by our associate, O. W. Morris, and also by Mr. Anthony.

Obs.—Allied to *A. salebrosa*, but has the tubercles of its last whorl larger, more obtuse, and irregular, and fewer in number. In adopting the above name for this species, proposed by Dr. Budd, I pay a deserved compliment to one of the most industrious and ardent naturalists in our Western States; though, in so doing, I reluctantly depart from a wholesome recommendation formally promulgated, first by the Scientific Congress of Great Britain, and afterwards by that of America. It is to be regretted that this recommendation has been so little heeded, but where the recognised *laws* of nomenclature hardly restrain, mere suggestions will be of little avail.

2. Cyclostoma inornatum.

Plate I. Fig. 7.

T. umbilicatâ, orbiculato-subdepressâ, subtenui, striatulâ, stramineo-

virente ; spirâ parùm elevatâ, apice obtusiusculâ ; anfr. 4, celeriter a scentibus, convexis ; suturâ profundâ ; umbilico mediocri, profu aperturâ subobliquâ, circulari, perist. simplice, continuo, recto, margin approximatis : operculo corneo, tenui, arctispiro, extùs concavius anfr. 8½.

Shell umbilicate, orbiculate, and somewhat conical, ra thin, with oblique hardly perceptible striæ of growth ; c of a light greenish-yellow, verging towards olive ; spire much elevated, with the apex rather obtuse ; whorls 4, rap increasing, convex, suture deep, umbilicus moderate, d aperture somewhat oblique, circular, its outline hardly br by the penult whorl ; peristome simple, continuous, strai its margins approximate : operculum horny, thin, a little cave without, closely spiral, with 8½ whorls united by incor cuous sutures.

Greater diam. 0.45 inch (11 millim.). Lesser diam. 0.40 i (10 millim.). Height 0.24 inch (6 millim.).

Length of aperture 0.21 inch (5 millim.).

Habitat.—Guadaloupe.

XVIII.—*Observations on Different Points of the Natural History of the Island of Cuba, with reference to the Ichthyology of the United States.*

By Felipe Poey, of Havana, Cuba, Corresponding Member.

Read Sept. 18, 1854.

I have described in my *Memorias sobre la Historia Natural de la Isla de Cuba*, Vol. i., page 374, several fish belonging to the family of the *Cyprinoids*, of the division which M. Agassiz has named *Cyprinodonts*, from their jaws being furnished with teeth. These species are allied to the genera *Pœcilia*, *Mollinesia*, and *Hydrargyra*, but differ sufficiently to prevent their being placed in any one of them. This obliged me to establish the genera *Gambusia*, *Girardinus*, and *Limia*, described in the above "Memorias." One remarkable peculiarity of all these Cyprinoids of Cuba is to be found in the anal fin of the males, which is always formed as shown by figures 31 and 32 of the work above referred to, besides which the males are one-third smaller than the females. This fin studied with care shows constantly 11 rays, of which the 3d, 4th, and 5th are always the stoutest.

In the classic work of Messrs. Cuvier & Valenciennes, the genus *Pœcilia* has seven species from equinoctial America; of which 4 are from South, 2 from Central America, and 1 from Hayti. The genus *Mollinesia* (*Mollienisia*) has but one single species, the *M. latipinna* of the southern U. States. The genus *Hydrargyra* is composed of three species from the U. States, and one from Spain. M. Valenciennes does not distinguish the sexes of the Pœcilias nor of the Hydrargyras, which would lead me to believe that he has only seen females: he has, on the contrary, only seen one male of Mollinesia in which the anal fin greatly resembles the anal of my Cuban genera. Dr. Storer does not allude to the sexual differences. I have not had the advantage of being able to consult all the works of different American Ichthyologists who may have written on the subject; but I invite these gentlemen, if they have not already done so, to examine the males of the American species, and to study the anal fin of this sex. Perhaps there might be something to rectify in the *M. latipinna:* as to the Hydrargyras, I know nothing of the male sex. It would be perhaps necessary and useful to count again with the greatest care, and on many individuals, the number of branchial rays.

I have also described in my "Memorias" a species of *Lepidosteus* (in English *Gar-pike*), to which I left the vulgar name of *Manjuari.* The animals of this species, intermediate between reptiles and fishes, have become celebrated from the point of view under which M. Agassiz has considered them; and the study of their swimming-bladder may throw some light on the function of this organ, so little known; and particularly on the mode of respiration of the *Lepidosteus.* As the fresh waters of the United States contain different species of this genus, it would be desirable to have the Ichthyologists of that country examine this subject; because my studies do not enable me to decide this important question. I here confine myself to the fish, with the exception of the Lepidosteus, derives directly from the atmosphere the gaseous element; for, though in different species the bladder communicates with the œsophagus, it is only by a long and narrow duct, which at most might serve for the expulsion of the gas. Matters are different in the Lepidosteus, which receives the atmospheric air in a peculiar organ, opened by means of a muscular glottis at the origin of the œsophagus. But it must be acknowledged that this organ, which according to different authors I had thought cellular, is really vascular, and performs the office of a lung, as I am about to demonstrate.

I continue the description of the bladder. It is a thin and transparent bag, which extends throughout the whole length of the abdominal cavity, somewhat bilobed at the two extremities. The longitudinal zone of the centre is simple, but both sides are complicated with an innumerable multitude of tubercles or vessels, which make them appear very much like the lungs of the Crocodile, as also in color, which is sanguineous. There is a tendency to the double lung of the superior animals. The bladder is joined on the superior part to the aorta, and yet more intimately to two venæ cavæ, which accompany the artery. On opening the bladder, numerous and large tubercles are found on both sides, as well as some smaller ones, and finally a net-work of thin vessels on the internal surface. These latter, which we might call vesicular arteries, branch from the aorta, and entering the bladder, carry the blood from each side to an inferior longitudinal trunk which acts as a common sinus, and from which branch the vesicular veins, which have the appearance of tubercles on the interior of the organ, and which carry the twice oxygenated blood into the venæ cavæ. The injection which I made into the aorta, assisted by Mr. François Cotilla, student of medicine, with a liquid charged with indigo, enabled me to see all the superficial arterioles blue; the thicker ones, which I have called veins, remaining white. I have seen with a lens, and even with the naked eye, the numerous openings with which the aorta is pierced, and I have injected it to that effect after having separated the bladder. I have not injec the longitudinal sinus; but I hope these experiments will repeated and completed in the United States, and also exten to other species of fish.

Before demonstrating anatomically that some sort of monary respiration existed in the Lepidosteus, the follow facts might have led one to expect it. The animal, when pl in a basin filled with water, maintained itself there all day w out movement. The branchial respiration was effected b constant motion of the lower jaw and the opercular bones; motion of the jaws being hardly visible, that of the oper more so. I have counted forty acts of respiration per min Every five to eight minutes he would come to the surfac swallow a mouthful of air, returning downwards immediat One second after, half a dozen air-bubbles, some quite la escaped by the opening of the branchiæ. The air remain the bladder one second, sometimes one and a half, and time is probably sufficient for the absorption, digestion, expulsion of the inspired air. Besides, it is certain that animal not attempting to swim, the bladder was not use under the anus. I am not aware whether the inspiration is active or passive, nor where the motive power resides.

The color of the fish generally is of a greenish brown, the lower parts of the body white, the fins are of a bluish brown, and when dried they turn green. The eyes are black: the scales are covered with a muscosity.

XIX.—*Description of a New Species of Humming Bird of the Genus Mellisuga Brisson, with a note on Trochilus aquila Bourcier.*

By George N. Lawrence. *Read April 2, 1855.*

Mellisuga albo-coronata.

THE WHITE-CROWNED HUMMING BIRD.

Plate IV.

In form comparatively short and stout; bill straight and slender, the nostrils hid by the frontal feathers; the wings extend a little beyond the tail, which is slightly rounded; outside of tarsi clothed for half their length with hair-like feathers; hind toe as long as the outer one.

Adult.—Front and crown silky and cream-white, forming a flattened crest, projecting over the sides of the head, the feathers of which (although not lustrous) have the scale-like form of metallic ones; all the upper and under plumage is of a glossy blue black, having on the neck and upper surface metallic reflections of cupreous red, most conspicuous on the lower part of the back; wing purplish black; wing coverts slightly bronzed with green; on the chin is a small tuft of feathers, diverging on each side, of a dull green, fringed with white; the two central tail feathers are deep purple, the others are white at the base for two thirds of their length on the lateral feathers, increasing to three-quarters on the others, with a terminal band of bluish-black edged with white; the outer margins of the outside tail feathers are black; upper tail coverts have crimson purple reflections, lower white; in the dried specimen the upper mandible is black, the lower brownish-yellow; the feathers on the tarsi are brown, terminating with white, tarsi and upper surface of feet brown, underneath, the feet are yellow.

Young.—Two specimens of young birds have the white crest feathers appearing next the bill, and along the edges of the crown, the centre of the crown being dull metallic green; the black of the under surface is intermixed with white, the upper plumage is green, with crimson reflections on the rump; the tail is marked the same as in the adult, except in being more tipped with white.

Length, 2½ inches; bill, ½; wing, 1⅜; tail, ⅞; the young do not differ much in size from the adult.

Habitat.—Veraguas, New Granada.

At first view the full-plumaged bird has the appearance of being only black and white, as the metallic reflections are not very observable except on examination.

"The first one I saw, was perched on a twig pluming its feathers. I was doubtful for a few moments whether so small an object could be a bird, but upon close examination I convinced myself of the fact and secured it. Another I encountered while bathing, and for a time I watched its movements before shooting it,—the little creature would poise itself about three feet or so above the surface of the water, and then as quick as thought dart downwards, so as to dip its miniature head in the placid pool, then up again to its original position, quite as quickly as it had descended.

"These movements of darting up and down, it would repeat in rapid succession, which produced not a moderate disturbance of the surface of the water, for such a diminutive creature. After a considerable number of dippings, it alighted on a twig near at hand, and commenced pluming its feathers.

"There is a peculiarity in this variety, which characterizes it somewhat, so far as my limited observation extends. It is, that its flight is not so persistent as the other varieties of the Humming-Bird, although as swift.

"In watching its movements while feeding, and under other circumstances, I have found that it would, at intervals, alight for a brief period, and much more often, indeed, than I had ever noticed in the other varieties. In fact, in the majority of instances that I have encountered this variety, it has either been at rest, or has, after a short flight, alighted.

"Upon examination of its wings, there has appeared to me to be a slight spread of them in proportion even for so small a bird, which would seem to corroborate this observation.

"J. K. M."

The plant represented in the plate is the two colored Cantua (*Cantua bicolor*) from the northern part of South America.

Trochilus aquila Bourcier.—The Humming bird presented to the Lyceum by our corresponding member, Dr. J. King Merritt and referred to me for examination, is of this species. Prin C. L. Bonaparte, in his "Conspectus Trochilorum," places it in his genus Myiaetina. Dr. Merritt obtained his specimen in Veraguas, N. G. The one described by Bourcier was in the collection of M. Loddiges, and came from St. Fé de Bogota.

There is an accurate figure of it in Gray's "Genera of Birds;" it is easily distinguished from all other species by the remarkable curvature of the bill, forming, as expressed by M. Bourcier, the third part of a circle.

In the accompanying note some interesting facts are communicated by Dr. Merritt, which will be considered a valuable addition to its history, as nothing is recorded of the habits of this species that I have met with; in fact, as a general thing, but little is known of the economy of this beautiful order o birds, especially those from mountainous or little frequented regions. The Trochilidæ are now attracting much attention i Europe, and any information elucidating their habits, derive from personal observation, is considered of importance.

"It was, as near as I can recollect, during the month of September, 1852, that I saw for the first time, and obtained specimen of this (to me) curious and novel bird. I was at tha time stationed in the mountainous district of Belen, province o Veraguas, New Granada.

"My attention, at that particular period of time, was directe the spot where I stood, when it suddenly stopped in its rapid course directly in front of a flower. There for a moment poising itself in this position, it darted upon the flower in a peculiar manner; in fact, the movements which now followed of this little creature, were indeed exceedingly curious to me. Instead of inserting its beak into the calyx by advancing in a direct line towards the flower, as customary with this class of birds according to my limited observation, this one performed a curvilinear movement, at first stooping forward while it introduced its beak into the calyx, and then, when apparently the point of the beak had reached the desired locality in the flower, its body suddenly dropped downwards, so that it seemed as though it was suspended from the flower by the beak. That this was not actually the case, the continued rapid movement of its wings demonstrated beyond a doubt. In this position it remained the ordinary length of time, and then by performing these movements in the reverse order and direction, it freed itself from the flower, and afterwards proceeded to the adjoining one, when the same operation was repeated as already described.

"'The flower from which it fed, and of which I gave you a rude and imperfect sketch, is somewhat peculiar also in its form, &c., and I will proceed to give you a slight description of it. The plant belongs to the Palm species, and grows in low, marshy places, on or near the margins of rivers and mountain streams. It consists of a dozen or more straight stems, each of which terminates above in a broad expanded leaf, that somewhat resembles the plantain. These stems all start from a clump at the surface of the ground, but they immediately separate, and slightly diverge from each other. The stems with the leaf grow to the height of six to ten feet, more or less. From one or two of the centre stems a flower-stalk puts forth, which hangs pendent, and to this are attached alternately on either side, the flowers, while the space between each corresponds with the attachment of the one on the opposite side of the stalk.

"The flower resembles somewhat in form the Roman helmet inverted, and is attached, as it were, by the point of the crest to the stalk. It is a fleshy mass, and the cavity of the calyx extends in a tortuous manner downwards, towards the attachment of the flower to the stalk.

"The color of the flower is a deep crimson, and the stalk has the same, excepting that it is of a much darker shade. So much for the description of the plant and flower.

"With regard to the bird again, I may add, that I have secured two specimens of it, which were the only ones I ever saw feeding, and in both instances they were feeding from the flower I have just described.

"J. K. M."

XX.—*Descriptions of New Species of* ACHATINELLA.

By W. NEWCOMB, M. D., Corresponding Member.

suture well marked; aperture ovate; lip thin; columella short, abruptly terminating in a large prominent plait; color of epidermis yellowish white, alternating with longitudinal chestnut lines; base of an umber color, with a revolving line of the same colour above.

This species does not make a near approach to any previously described, and is so strikingly characteristic that the description is given from the only specimen ever obtained.

2. **Achatinella humilis.**

A. testâ elongatâ, conicâ, longitudinaliter rudè striatâ; anfr. 7 superne rotundatis, in medio sub-planis; ultimo superne obscure carinato; suturâ profundâ, simplici; apice acuto; aperturâ sub-rotundâ; labro acuto, intus incrassato; columellâ complanatâ, plicâ crassâ instructâ; colore testæ rubro-flavido, epidermide densè nigrâ obtecto; columellâ et labri exterioris margine profundo, intus nigro-fuscis; aperturâ intus cœruleo-albâ.

Long. $\frac{14}{16}$; lat. $\frac{7}{16}$ poll.

Habitat.—Kalai, Molokai. On the ground, under low bushes.

Shell elongately conical, longitudinally rudely striate; whorls 7, rounded above, flattened centrally; last one obscurely carinated superiorly; suture deep, simple; apex acute; aperture subrotund; lip acute, slightly thickened within; columella flattened with a thick plait; color of shell pale salmon, covered with a densely black epidermis; columella and a deep margin of the outer lip within dark brown; interior of aperture bluish white.

3. **Achatinella petricola.**

A. testâ dextrorsâ, acuto-conicâ, longitudinaliter rude striatâ; anfr. 6, rotundis, ultimo sæpe inflato; suturâ simplici, impressâ; aperturâ rotundo-ovatâ; labro acuto, intus sub-incrassato; columellâ longiori, plicâ revolvente sub-centrali instructâ; sæpe umbilicatâ; colore fusco. cor-

neo; labro externo et columellari externe albo vel flavido eva marginatis.

Long. $\frac{19}{20}$; lat. $\frac{4}{20}$ poll.

Habitat.—Molokai, or the rocky sides of a Pali or precij

Shell dextral, acutely conical, longitudinally coarsely stri whorls 6, rounded, sometimes the last one inflated; suture sin well impressed; aperture roundly ovate; lip acute, slightly tl ened within; columella rather long, with a sub-central rev ing plait; often with an umbilicus; color dark corneous, c and columellar lips margined externally with white or yello white.

4. Achatinella fusoidea.

A. testâ sinistrorsâ, sub-solidâ, elongate productâ; anfr. 6–7, vix r datis (ultimo excepto), superne marginatis; suturâ impressâ; ape rotundo-ovatâ, parvâ; columellâ brevissimâ, robustâ, plicatâ; superne simplici, inferne sub-expanso; colore stramineo.

Long. $\frac{15}{20}$; lat. $\frac{5\frac{1}{2}}{20}$ poll.

Habitat.—E. Maui.

Habitat. Ranai.

Shell dextral, conically ovate; apex acute; whorls 6, plano-convex; suture above but lightly impressed; below, strongly marked; lip simple; columella short, with a twisted plait; epidermis light brown, often encircled by narrow white bands.

This shell has been looked upon by some of my European correspondents as a small variety of *A. cylindrica* Nob., from which it is widely separated in locality, coming from a distinct conchological province, varying in the animal, and quite distinct in the shell. In the *cylindrica* the bands are impressed into the substance of the shell, in this species they are laid upon the epidermis.

In the first-named, the adult is more than double the size of the present species as usually found.

6. Achatinella Dwightii.

A. testâ oblongâ conicâ, sinistrorsâ, solidâ, striis oblique longitudinalibus, lineis transversis exiguis, subundulatis numerosissimis intersectis, obtectâ; anfr. 6, plane convexis; suturâ simplici, impressâ; aperturâ ovatâ; columellâ latâ, brevi, et leviter plicatâ; labro exteriori expanso, infra sub-reflexo; sub-umbilicatâ; colore cinereo-albo maculis et signis zigzag fuscis, in anfracto ultimo evanidis; aperturâ et labro sub-albis.

Long. $\frac{12}{16}$; lat. $\frac{9}{16}$ poll.

Habitat. Molokai.

Shell oblong conical, sinistral, solid; surface covered with oblique longitudinal striæ, cut across by very numerous fine, slightly undulating, cross striæ; whorls 6, flatly convex, crenulated at the sutures; suture simple, well marked; aperture ovate; columella broad, short, and slightly twisted; outer lip expanded, sub-reflected below; sub-umbilicated; color a greyish white, with numerous blotches, and zigzag markings of brown, more obscure on the last whorl; aperture and lip of a dingy white.

I take pleasure in making my acknowledgments to the Rev. S. C. Dwight, of Molokai, for his very valuable assistance rendered to me in my researches on that island and Ranai.

7. Achatinella Remyi.

A. testâ acuminato-oblongâ, striis obliquo-longitudinalibus numerosis, distinctis; anfr. 7, rotundis, superne minute marginatis vel planis; suturâ sub-profundâ; aperturâ sub-ovatâ; columellâ sub-callosâ, plicâ terminali lamellari; colore rubro-flavido lineis zigzag nigris numerosis ab apice ad basin continuis ornato; labro interno purpureo marginato.

Long. $\frac{14}{20}$; lat. $\frac{6}{20}$ poll.

Habitat. Ranai.

Shell acuminately elongate, striæ numerous, well defined, obliquely longitudinal; whorls 7, rounded, minutely margined above or plain; suture rather deep; aperture sub-ovate; columella slightly callous, with a terminal lamellar plait; color salmon, been anticipated in the January (1855) issue of Proceedings of the London Zoological Society, and must yield to the names there given by Dr. Pfeiffer.

A. Wheatleyi Nob. is *A. vidua* Pfeiffer.
A. oviformis Nob. is *A. Sowerbyana* Pf.

As the investigation of this genus is understood to be still in progress by Dr. Pfeiffer, a delay in publishing a synopsis is demanded, until he shall have completed his examination; when I propose to give as complete a work upon the subject, as a five years' study, and my voluminous notes upon the shells and animals of this genus, will permit.

XXI.—*Notes on certain Terrestrial Mollusks which inhabit the West Indies.*

By T. Bland. *Read June 4 and Oct. 22, 1855.*

I. ON THE OCCURRENCE OF PUPA BICOLOR HUTTON IN THE ISLAND OF ST. THOMAS.

Shortly after communicating to the Society Mr. R. J. Shuttleworth's Catalogue of the Terrestrial and Fluviatile Shells of St. Thomas (Ann., Vol. iv., p. 68), I received another species, which had just been discovered in that island, viz. *Pupa bicolor* Hutton.

A dead shell was found there in February, 1854, by one of the family of Mr. A. H. Rïise, and a considerable number of live and dead specimens have since been collected in the same locality, near the town, in "Berg's Garden" by the "Gut" which runs behind the Protestant Episcopal Church.

On receipt of some of the shells I submitted them to Mr. J. H. Redfield, who determined the species.

Benson, in Ann. and Mag. of Nat. Hist., Vol. iv., 2d series (1849), mentions that the beautiful vermilion and yellow tint (seen through the shell, which is diaphanous and colorless), firs attracted his attention to the animal in Bundelkhund in 1825 and that he subsequently took it at the foot of the Himalaya in Rohilkhund; in the Do-ab of the Ganges and Jumna; a Jounpore and Mirzapore, in the Benares division, north an south of the Ganges; and on the west bank of the Hooghl river, near Calcutta. In 1847 he met with it at Point de Gall in Ceylon, and Dr. Cantor found it, though rarely, in Pul Penang. Benson did not collect it at the Mauritius, though Pfeiffer ascribes it (*P. Largillierti*, Phil.), on the authority o Largilliert, to the Isle of Bourbon.

Benson says that *Pupa bicolor* "shelters itself in the ground under the loose stones, bricks, or wood." At Bhamoury, he go it "by digging at the root of a tree." The *station* of the specie is the same in St. Thomas.

Pupa bicolor belongs to *Ennea*, a subgenus of Pupa, proposed by H. and A. Adams in their *Genera of Mollusks*. Pfeiffer

II. On the Animal of Proserpina.

In a paper published in the Annals of the Lyceum (vol. iv., p. 75), I explained that the animals of the species embraced in the Fam. *Helicinacea*, and also in the genus *Proserpina*, destroy the spiral column and septa of their shells. In another paper (Ann., *l. c.*, p. 77), I showed that *P. opalina* C. B. Adams, having the spiral column and septa entire, must be restored to Helix, in which genus Adams originally placed it, and I proposed for it the specific name, *infortunata.*

Examination of the animals of this species, and of species of Proserpina, has proved the accuracy of the conclusion derived from the shells alone.

The Hon. Edw. Chitty, on the receipt of copies of my papers, informed me of his previous discovery that the animal of Proserpina is nearly allied to that of Helicina, having one pair of tentacles only, with eyes at their external bases, the head produced into a "snout," while the animal of *P. opalina* is the same as of Helix.

Mr. Chitty has since verified his description of the animal, and M. Poey confirms its correctness as to the number of tentacles, having examined the animal of the Cuban species.

The characters of both animal and shell are such as to suggest the possible existence of an *operculum*, but Chitty and Poey have not been able to detect any such appendage.

D'Orbigny, in Moll. Cuba I. (1841), judging from the shell alone (though he failed to find an operculum), and as Poey expresses it, "por un feliz presentimiento," included Proserpina (under the generic name of Odontostoma) with Helicina and Cyclostoma, in *Cyclostomidæ*, while Poey in his "Memorias," vol. i., p. 392, having knowledge of the animal, establishes the family *Proserpinacea.*

The discovery of the nature of the animal of Proserpina is of great interest, with especial reference to the question of the value of the operculum, in any natural arrangement of the Terrestrial Mollusks having two tentacles with basa eyes.

Pfeiffer, in his Monographia, and Gray in the British Museu Catalogue, place all such Mollusca in the Order *Pneumonopom* which they divide into the two sub-orders, *Opisophthalma* an *Ectophthalma* (with reference to the position of the eyes behin or in front of the tentacles), the former Order including the F mily *Aciculacea,* and the latter *Cyclostomacea* and *Helicinace* one of the characters of the Order, and of course of the su orders and families, being an operculum. These authors, mo over, in the further subdivisions into genera, rely greatly, a in my opinion unduly, on the nature of the operculum.

The arrangement thus briefly described, must therefore remodelled, since it now improperly excludes *Proserpinace* which family, though inoperculate, is from all its other chara ters, both of animal and shell, entitled to admission into the sa Order which contains the sister family *Helicinacea.*

III.—ON THE STRUCTURE OF THE AXIS OF THE SHELL C CYLINDRELLA.

C. tenella C. B. Ad., is the same, and also, I imagine, in the other Jamaica allied species, although the fact is not discoverable on examination of their apertures.

The structure of *C. Agnesiana* C. B. Ad., is shown in Pl. v. fig. 16. In other species the axis has revolving lamellæ,—there are two in *C. pruinosa* Mor. (Pl. v. fig. 17), and from three to six in *C. Oviedoiana* Orb., within each of the whorls,—the number increasing towards the base of the shell.

I directed the attention of Poey to the formation of *C. elatior*, and he sent me a specimen marked *C. Oviedoiana*, and opened so as to exhibit the extraordinarily developed lamella shown in Pl. v. fig. 18. I have since detected the same in two other specimens; in one it is on the outer side of the axis in the second whorl, and in the other, it extends from the third to the second whorl, counting upwards from the base.

On subsequent more careful examination, Poey found the axis of *C. Oviedoiana* as I have above stated, and that the shell forwarded to me, of which he had other specimens, is of a different species,—the large lamella figured being constant, as well as other characters sufficiently distinguishing it. He has described it as *C. strangulata.*

Observations on the internal structure of shells are not devoid of scientific value, aiding in the determination of the genus, as in the case of *Proserpina opalina*, and of the species in that of *Cylindrella strangulata.*

IV.—CORRECTIONS AND ADDITIONAL FACTS, ESPECIALLY AS TO THE HABITAT OF SUNDRY SPECIES.

HELIX CASSIQUIENSIS NEWCOMB, M. S.

Pfeiffer and Reeve erroneously attribute this species to Cuba. Dr. Newcomb assures me that he collected it near the Cassiquia Creek, in Demerara, from whence its specific name.

HELIX COGNATA FER.

No habitat is assigned by authors to this species. It is from Jamaica, and I am indebted to the Hon. E. Chitty fo several fine specimens.

HELIX CONSPERSULA PFR.

This is also a Jamaica species, from whence I have receive it,—it is by no means abundant.

HELIX CORNU-MILITARE L.

Pfeiffer refers this fine species, on the authority of Dr. Jay to the Sandwich Islands. Many individuals were collected i 1853 in that part of the Island of Haiti, which constitut the Dominican Republic, by Sallé, who favored me with specimen.

HELIX FORMOSA FER.

This species has been generally attributed to Guadaloup I have received a considerable number, one with the anim alive, from the Rev. A. Hamilton, who collected them i Antigua.

he had an individual of this species from Mr. Cuming, who gave as habitat, the Corean Archipelago. I found no trace of it in Bermuda, nor did the late Professor C. B. Adams.

HELIX PENICILLATA GOULD.

Dr. Gould admits, in correspondence with M. Poey and myself, that his shell is a variety of *H. Cubensis* Pfr. I do not know *H. penicillata* Pfr., Mon. iii. No. 1287.

HELIX SAGRAIANA D'ORB.

This hitherto rare species has recently been rediscovered by Dr. Gundlach, with others equally interesting, in the mountains between Guajaibon and Rangel, from twenty to thirty leagues west of Havana. Pfeiffer describes (Mon. i.) a shell under this name, attributing it to California, on the authority of Sowerby—he probably refers to Orbigny's species, being in error as to the habitat. Poey (Memorias i.) suppresses it as a Cuban species, evidently misled by Pfeiffer.

I would here acknowledge my great obligation to Dr. Gundlach for specimens of this and other rare Cuban shells, contributed by him to my cabinet, in the most handsome and liberal manner.

HELIX SIMILARIS FER.

Among shells lately received through me from Barbadoes, Mr. Shuttleworth detected this widely distributed species. Pfeiffer gives Cuba as one of its localities, on the authority of Rang, but it has not been discovered or communicated to Poey, who excludes it in his Cuban catalogue.

BULIMUS AULACOSTYLUS PFR.

This species was described in the Annals of the Lyceum, Vol. iv. p. 14 (May, 1854), as B. lentiginosus, by Mr. J. H. Redfield. Pfeiffer's description was *read* before the Zoological Society of London, in March, 1852, but first *published*, I believe, in the third volume of his Monographia, the introduction to which bears date May, 1853. The delay in the publication of the Society's Proceedings was certainly very inconvenient, leading to doubt and uncertainty as to priority. Pfeiffer, on the authority of the Rev. E. Hartvig (not Hartwig), in Mus. Cuming, ascribes the species to St. Lucia. It was collected by the late J. M'Murray, who gave specimens to Mr. Hartvig, as he informs me, as from St. Lucia. Mr. Hartvig sent the shell to Mr. Cuming. I received several specimens from Mr. M'Murray, with a written note as to its station and habitat for the information of Mr. Redfield. The note in question fixes as habitat the district of San Fernando, in the Island of Trinidad, and also a spot near the junction of the Massaroony and Essequibo rivers, in Demerara.

CYLINDRELLA TRICOLOR PFR.

Mr. Shuttleworth found this pretty species, to which no habitat is assigned by Pfeiffer, among Jamaica shells received by me from the Rev. F. R. Holland. A number of specimens collected in that island have since been sent to me by Mr. Chitty, who has described it in his Contributions to Conchology, No. i. p. 11, as *C. Maugeri* Wood var. *raphinina.*

CYCLOSTOMA VERSICOLOR PFR.

The habitat of this species is not given by authors. I received three specimens from Mr. M'Murray, which were *field*, in the Annals of the Lyceum, Vol. iv. p. 131, under the name of *C. inornatum.* I have since received specimens from M. Petit.

XXII.—*Descriptions of Two New Species of* CYLINDRELLA, *from Jamaica, West Indies.*

By the HON. E. CHITTY, of Jamaica, Corresponding Member.

Read September 11, 1854.

Cylindrella megacheila.

Plate V. Figs. 1, 2.

T. rimatâ, truncatâ, ovato-cylindriceâ, solidâ, sericinâ, rubro-fuscâ, infra suturam purpureo-fasciatâ, striis confertissimis obliquis elegantissime sculptâ; suturâ impressâ; anfr. superst. 7–8, ultimis subequalibus, ultimo adnato, basi obsoletissime carinatâ; aperturâ rotundâ; peristomate valde expanso.

Shell of the *C. rosea* group; ovate cylindrical, very robust; the upper remaining whorls tapering suddenly; deep plum color, with a lighter tinge of the same extending over the lower half of the whorls, especially the fourth and fifth; aperture of a paler, dingy, plum color, with an elegant silky lustre, produced by crowded, oblique, very fine striæ, rather finer than in *C. zonata;* carina on the last whorl almost obliterate; spire with convex outlines; narrower near the aperture, broadest about the third or fourth whorl; apex truncate, with the loss of — whorls; whorls remaining 7, rather flattened, very slightly margined on the lower side, with a slightly impressed suture. Aperture, as in most other species of the *C. rosea* group; lip very much expanded, reflected, and thickened, especially in the lower part; appressed to the last whorl, as in *C. nobilior*, &c.

Length, 1.05 inch; diameter, .4 inch. at third whorl; length of aperture, .2 inch.; length of lip, .4 inch.

Habitat.—Endeavour Moreland, in the parish of Hanove Jamaica.

Cylindrella amethystina.

Plate V. Figs. 3, 4.

T. rimatâ, truncatâ, subcylindricâ, elongatâ, sericinâ, amethystin infra suturam saturatiori, striis obliquis sculptâ; suturâ impressâ, marg natâ; anfr. superst. 10, subequalibus, subplanis, ultimo adnato; apertu subcirculari; peristomate luteo-fulvo, expanso, breviter reflexo.

Shell of the *C. rosea* group, almost cylindrical, elongat deep plum color, with a lighter band of the same on the low half of the whorls; with rather coarse oblique striæ, yet givi the shell a silky lustre; spire with outlines convex, but ve little so about the third, or fourth and fifth whorls; apex tru cate, with the loss of — whorls; whorls remaining 10, scarce convex, margined or shouldered on the lower side, with moderately impressed suture; lip appressed to the last who small, expanding more on the right than left side, on the uppe part oblique and angular; of a dingy light (almost white plum color; thickened and reflected as in other species of thi group.

XXIII.—*Descriptions of Four New Species of Terrestrial Shells, from Siam.*

By Wm. A. Haines. *Read October* 22, 1855.

1. **Cyclostoma Housei.**

Plate V. Figs. 12–15.

T. latissime umbilicatâ, discoideâ, solidâ, striatulâ, strigis crebris angulatis castaneis pictâ; spirâ parum elevatâ; suturâ canaliculatâ; anfr. 5 convexiusculis, ultimo antice valde soluto, descendente; aperturâ circulari; perist. incrassato in tubulo retrorso extenso.

Operc. extus convexum, lamellis angustis 3–4 spiratis convolutum, intus concavum, nitidum.

Diam. maj. 26, min. 21, Alt. 13 mill. Ap. 10 mill. diam.

Habitat.—Siam.

A very remarkable species, belonging to the subgenus Pterocyclos. The last whorl is much separated from the others, and is furnished with a remarkable tube close to the aperture.

I take great pleasure in dedicating this species to my friend, Dr. Samuel R. House, to whom I am indebted for this, as well as many other new and interesting Siamese shells.

2. **Cyclostoma Myersii.**

Plate V. Figs. 9–11.

T. perforatâ, ovato-oblongâ pupaeformi, latere aperturæ compresso, opposito inflato; solidâ, sublævigatâ, castaneâ; spirâ oblongo-conicâ; apice obtusâ; anfr. 6 convexis, ultimo attenuato, penultimo pone compresso; aperturâ subverticali, subcirculari, superne angulatâ; perist. continuo, incrassato, expanso, subreflexo, flavo.

Operc. ?

Long. 36, diam. 18 mill. Ap. intus 10 mill. longa.

Habitat.—Siam.

This species belongs to the subgenus Megalomastoma, and is the largest of this division of the genus which I have yet observed.

3. **Cyclostoma distortum.**

Plate V. Figs. 5–8.

T. umbilicatâ, distortâ, globosâ, conicâ, longitudinaliter minutissime striatâ, albâ; spirâ conicâ; suturâ valde impressâ, simplici; anfr. 5 convexis, ultimo inflato, prope aperturam constricto; aperturâ circulari; perist. simplici, incrassato-expansiusculo.

Operc. ?

Diam. maj. 12, min. 10, alt. 11 mill. Ap. 5 mill. diam.

Habitat.—Siam.

Closely allied to *C. gibbum*, but differs essentially; being larger, the last whorl more inflated, lip more broadly reflected, and the striæ finer and more numerous.

4. **Vitrina Siamensis.**

T. depresso-globosâ, tenui, lævigatâ, pallide corneâ; spirâ vix elevatâ; anfr. 3 celeriter accrescentibus, ultimo inflato; aperturâ obliquâ, coarctatâ, rotundato-quadratâ; perist. simplici, margine columellari arcuato.

Diam. maj. 30, min. 24, alt. 15 mill.

Habitat.—Siam.

recurved, sub-central; anterior and posterior slopes, convex; lateral slopes, plane; apicial region rose-colored.

Habitat.—Green River, Kentucky; adhering to small stones and dead shells. Very rare.

My Cab. Cab. Lyceum, N. Y.

Length, 0.26 inch (6½ mill.); breadth, 0.21 inch (5 mill.); height, 0.14 inch (3½ mill.)

Obs.—This is rather a heavy, robust species, and one not easily confounded with any other; it most nearly resembles, perhaps, *Ancylus crassus* Hald., but differs from it in being more elevated, in having the lines of growth coarser, and by its rosy apex. It is more elevated than any other specimens of the genus with which I am acquainted.

It is somewhat singular that this should have been the only species of Ancylus noticed in a journey of nearly 1,800 miles, during which every stream was examined for shells, and this genus was anxiously sought for.

Anculosa ampla.

Plate V. Fig. 22-23.

T. ovato-globosâ, glabrâ, virente, purpureo-fusco quadrifasciatâ; spirâ brevi, erosâ; anfr. 2–3, ultimo humeroso, tuberculis perpaucis propè suturam vix perspicuis; suturâ profundâ; aperturâ ovatâ, intus purpureo-fasciatâ; columellâ excavatâ, planatâ, fuscâ.

Shell ovate-globose, olive-green, with four dark-colored bands; spire very short, eroded; whorls 2–3, the last one shouldered, and peculiarly flattened just before completion, and having the shoulder raised into a few very slightly defined tubercles, which in some individuals are hardly perceptible; suture deeply excavated; aperture ovate, showing the dark bands of the exterior; columella brown, excavated and flattened, without basal sinus, giving that portion of the shell much resemblance to a Littorina.

Length, 0.62 inch (16 mill.); diameter, 0.42 inch (11 mill.);

length of aperture, 0.42 inch (11 mill.); breadth of ap
0.35 inch (9 mill.).

Habitat.—Alabama.

XXV.—*Description of a New Species of Bird of the* SYLVICOLA SWAINSON.

By JOHN GUNDLACH, M.D., of Havana, Cuba.

Read October 22, 1855.

Sylvicola pityophila.

THE CUBAN PINE WOOD WARBLER.

Adult Male.—The forehead and crown yellowish oli
base of each feather dull; neck and upper parts cinereous
dusky, with an olivaceous tint; throat lemon yellow, with
edge; abdomen and under tail-coverts cinereous white
cinereous; wing feathers blackish with cinereous edges,
quill the longest; wing-coverts black with whitish edg

In its manners, as much as I was able to observe, it resembles those of the other Wood Warblers, though I never saw it hang to the branches like *S. pensilis*, to which it has some resemblance in color.

Its notes are similar to those of *S. discolor* and *S. astiva.*

XXVI.—*Remarks on the Quantity of Rain at Different Heights.*

By Professor O. W. Morris, New York.

Read September 17, 1855.

At a meeting of the Lyceum of Natural History of New York in 1846, and at the meeting of the American Association for the Advancement of Science, at Albany, in 1851, some account was given of the quantity of rain at different heights, with the hope that some other observers would, from the few hints given, take up the subject, and furnish some more definite information than was yet known, especially in this country; but nothing has yet fallen under my observation. Absence from the state, and other causes, hindered me from prosecuting the inquiry till 1854, when a gauge, such as used by the observers of the Smithsonian Institution, was placed on the observatory of the Institution for the Deaf and Dumb, in New York city, and a similar one on the surface of the ground; the upper one eighty-five feet above the lower.

From observations with these instruments, it has been ascertained that the difference in quantity depends upon a variety of circumstances; for the quantity is generally increased in a sudden thunder shower, or violent wind; while with but little wind, or a moist atmosphere preceding the rain, the difference is slight. Thus in twelve thunder-storms which occurred in twelve months, the lower gauge afforded 8.33 inches, and the upper 5.35 inches, showing a difference of 1.98 inches;

while in twelve storms which occurred with light winds or none at all, the lower gauge afforded 4.75 inches, and the upper 4.05 inches, showing a difference of only 0.07 of an inch.

With a moist atmosphere preceding seventeen storms, some of them lengthy, the lower gauge afforded 11.73 inches, the upper, 7.97, a difference of 3.76 inches; and with a dry atmosphere preceding the storm, thirty-eight storms afforded in the lower gauge 31.37 inches, and the upper, 23.13 inches, showing a difference of 8.24 inches. In the first instance the average difference for each storm was about 0.21 inch; in the latter, it was 0.22 inch. It would therefore seem that whenever there is much disturbance by winds, &c., there is less ability in the vapor to rise to any considerable height, owing, in part, to the increased weight of the falling fluid; or else there is a more rapid condensation of the vapor at the surface of the earth, which agrees with the theory of Mr. Russell, that "the vapor rises continually from the earth, and is condensed by the latent heat which it furnishes in its condensation."

Whether this theory be the true one or not, there is much plausibility in it, and in many cases it is applicable, while in a few it fails to apply, especially in long continued rains.

A satisfactory theory has yet to be established, and the facts that have been, and are now collecting, will serve to suggest nce in our country make itself known and felt by its benefi-l results to society; and not the least among them will be ch as follow the investigation of the laws governing the fferent states of the atmosphere.

With the apparatus mentioned above, the following results ave been obtained; premising, however, that during the months of winter no record of the difference was kept, as the drifting of the snow and other causes rendered the observations not reliable. A record was kept of the direction of the wind, the height of the mercury in the dry and wet bulb thermometers, with the relative humidity and force of vapor, the duration of the rain storms, as well as the quantity of water collected in each gauge. To note all these circumstances in this paper would make it too long, and be interesting to only a few, therefore the aggregate results for each *month* will be mentioned.

No. of Storms.		Prevailing Winds.	Quantity.	
			Upper. Inches.	Lower Gauge. Inches.
April, 1854	6	Easterly.	2.703	3.82
May, „	6	Easterly.	3.12	4.28
June, „	7	Easterly.	1.68	2.29
July, „	2	Easterly.	2.20	2.72
August, „	2	Easterly.	3.20	4.15
October, „	4	Easterly.	1.67	2.65
Nov. „	4	Westerly.	2.81	4.33
April, 1855	6	Westerly.	2.42	2.86
May, „	3	Easterly.	3.50	4.90
June, „	8	Easterly.	4.10	5.83
July, „	7	Easterly.	3.44	5.46
August, „	4	Easterly.	2.06	2.90

The greatest monthly difference was in July, 1855, when it as 2.02 inches; the greatest in any one storm, was in No-ember, 1854, a difference of 1.18 inches, the storm was of bout twenty-two hours' continuance, and the wind, West.

The least monthly difference was in April, 1855,—0.44 i and the least in any one storm, was in July, 1855,—0.02 i the storm was about twelve hours' duration, and the w North-East, and light, the air on the previous day was d and but little wind. The quantity for the six cooler mo was 26.22 inches in the upper, and 22.94 inches in the l gauge, showing a difference of 6.72 inches. The quantit the six warmer months, was 16.69 inches in the upper, 23.35 inches in the lower, a difference of 6.66 inches, show difference of only 0.06 inches between the warm and cool mo There were seventeen storms in which the atmosphere pr ing their commencement was moist, when the difference 3.76 inches; and thirty-eight storms, in which it was dry, a difference of 8.24 inches. The difference in thirteen th showers was 2.98 inches, in a quantity of 5.35 inches i upper, and 8.33 inches in the lower; and in a quanti 4.05 inches in the upper, and 4.75 inches in the lower, was a difference of 0.70 inch, when there was little or no The general result for the twelve months is 32.90 inch the upper, and 46.29 inches in the lower gauge, a differen 13.39 inches. Of the storms, thirty of them occurred wit

XXVII.—*Descriptions of New Species of Birds of the Genera Chordeiles, Swainson, and Polioptila, Sclater.*

By Geo. N. Lawrence.

Read 22d December, 1856.

Chordeiles gundlachii.

Male.—The entire upper plumage is blackish-brown, having the feathers margined and spotted with rufous, which is more distinct and brightest on the crown and scapularies; the lesser wing coverts edged with bright rufous; the greater wing coverts and tertiaries, speckled with greyish-white and pale rufous; quills dark umber-brown, with a white transverse bar crossing the middle of the first five primaries, except on the outer one, where it is confined to the inner web, with a marginal spot of white on the outer web; tail dark brown, with a white sub-terminal band, which crosses all, except the two central feathers, on some of the feathers it does not quite extend to the edge of the outer web, the tail is also crossed with narrow irregular bars of pale rufous; throat with a white triangular mark, below which the feathers are dark-brown, with rufous tips; breast pale rufous-white, crossed by very distinct bars of blackish-brown; abdomen and under tail coverts rather light rufous, also with dark transverse bars; on each of the under tail coverts there is a sub-terminal spot of pure white succeeding the black bar; outer edge of the shoulder white; inner wing coverts barred alternately with pale rufous and brown; bill blackish; tarsi and feet reddish-brown in the dried specimen.

Female, young.—The entire upper plumage in this specimen is dark brown, mottled with rufous, without any greyish tints; there is no distinct spot on the throat or white band on the tail; the white bar on the primaries is more restricted than in the male; the under surface and tail coverts, dull rufous intermixed with brown on the throat and neck; the breast, abdomen, and under tail coverts with bars of dark brown, much narrower and more numerous than in the male.

Length of male (skin), $8\frac{1}{2}$ inches; wing, from flexure, $6\frac{1}{4}$; tail, $3\frac{7}{8}$ in.; tarsus, $\frac{1}{2}$ in.; bill, from front, $\frac{5}{16}$ in.; wide at base, $\frac{4}{16}$ in.; middle toe and claw, $\frac{13}{16}$ in., outer $\frac{7}{16}$ in., hind $\frac{5}{16}$ in.
Fem. length, $8\frac{1}{4}$ in.; wing, from flexure, $6\frac{3}{4}$ in.; tail, $3\frac{3}{4}$ in.

Habitat.—Cuba.

The male above described was sent me recently by Dr. J. Gundlach, of Cardenas; it was labelled *C. virginianus*, which it much resembles, although I saw at once that it was a distinct bird; it is smaller and much handsomer, the colors being brighter and more decided, the rufous tints predominating, which in the other are grey.

The female I received some months since, also from Dr. Gundlach, who thought it the young of *C. virginianus*. I

Chordeiles texensis.

"Chordeiles brasilianus, Gm."—*Lawrence Ann. Lyc.* V. p. 114.
" ———— sapiti, Bonap."—*Cassin, Birds of Cal. & Tex.*, Vol. I. p. 238.

Male.—Upper plumage umber-brown closely mottled with cinereous white and pale rufous, an irregular band of these colors on the hind neck; a whitish line extends over the eye; quills dark umber-brown, the first four primaries are crossed by a bar of white at about two thirds the distance from the shoulder to their ends; above this bar on the primaries marked with it, and on the others for their entire length, as well as on all the secondaries, are small irregular rufous spots, arranged generally in pairs one on each side of the shaft; inner wing coverts and axillars pale rufous, barred with brown; tail brownish-black with a subterminal band of white crossing all except the two central feathers; it is also crossed with smaller irregular bands of pale rufous, the two central feathers have the bars broader and mottled with cinereous; under tail coverts pale rufous; throat with a large triangular spot of pure white; under plumage pale rufous or fulvous with narrow transverse bars of brown; bill black; legs and feet pale yellowish-brown.

Female.—More marked with rufous, which is of a deeper color on the under plumage than in the male; there is no white bar on the tail; the white markings on the throat and wings are tinged with rufous.

Length of male, 8¼ inches; wing, 6¾ in.; tail, 3¾ in.; tarsus, $\frac{8}{16}$ in.; middle toe and nail, ⅞ in.
Female, length, 8¾ inches; wing, 7 in.; tail, 4¼ in.

Habitat.—Texas.

This species was first noticed by me as an addition to our Fauna under the name of *C. brasilianus*, in the Annals of the Lyceum, as referred to above. At the time of describing, I had some misgivings as to the propriety of considering them identical, and upon a more recent investigation, am convinced of their being specifically distinct.

Mr. Cassin, in his Illustrations of the Birds of California and Texas, as above cited, refers it provisionally to the *C. sapiti* Bonap. The description given by Prince Bonaparte (Consp. Avium, p. 63) of his species is so short and with so few characters, as to make a comparison difficult, but sufficient I think to consider them unlike. He gives no measurements and describes by comparing it with *C. virginianus*, which he says, it is very much like, but smaller, and the color cinereous, not blackish; he gives as its habitat, Amer. Merid.

The rufous spots on the wings are so marked in the Texas species, that I think they certainly would have been characterized, if occurring in the one described by him, as "*sapiti*." Their locality is also very different.

I therefore think they may be viewed as distinct species until proved to be identical on the outer margin, tip not white; under surface pale cinereous white; bill black; legs dusky.

The female differs from the male only in being without the black on the crown.

Length, 4¼ inches; wing, 1⅞ in.; tail, 2⅛ in.; tarsus, ⅝ in.

Habitat.—Texas, California.

Since my introduction of this bird into our Fauna as *C. atricapilla*, Sw., I have ascertained it to be a different species. The two resemble each other in markings and coloration, but *C. atricapilla* (the proper name of which is "*leucogastra*," Wied) is a larger bird, measuring five inches and having the under plumage more purely white; that color extends over both webs of the three outer tail feathers, except at the base, where they are black, whereas in the present species it is confined to the outer webs and tips of the first and second feathers, with a mere margin of white on the third.

Excellent figures of this species are given by Mr. Cassin in his Illustrations of the Birds of California and Texas. He considers it to be the *C. mexicana*, Bonap. Consp. Avium, p. 316. The specimen so named by Prince Bonaparte was a female; the description given by him was very concise, and I do not regard it as applying well to this species. Mr. P. L. Sclater, who examined the original specimen in the Berlin Museum, views it as the female of *C. cerulea.* See his article, "On the Genus Culicivora of Swainson," in the Proceedings of the Zool. Soc. 1855, p. 11; he therein proposes to change the generic name of this group to *Polioptila.*

For a year or more past, I have considered this species to be different from all others, and appropriated for it the specific name of "*atriceps*," but at the suggestion of Mr. Sclater (who thought it too much like the one under which it was first noticed), I adopted the one now applied to it.

XXVIII.—*Descriptions of two New Species of North Americ Helicidæ.*

By John H. Redfield.

Read December 29th, 1856.

1. Helix Elliotti.

Testâ angustè umbilicatâ, orbiculato-depressâ, striatulâ, virente-corne subdiaphanâ, subtus nitidâ; spirâ convexâ, parum elatâ; anfractib quinque, convexiusculis, ultimo vix depresso; suturâ impressâ; apertu obliquâ, lunato-circulari; peristomate sinuato, acuto, intus incrassato.

Shell, with a rather narrow umbilicus, depressed-orbiculat with fine transverse striæ, greenish horn-colored, scarcely tran lucent, shining beneath; spire convex, but not much raise whorls five, rather convex, last one sometimes very slight depressed at the aperture; suture deeply impressed; apertu very oblique, lunate-circular; peristome a little sinuate, acu but thickened within.

species above named. *H. demissa* Binney seems to be related, but is barely perforate, not so much depressed, and instead of the slight, equally distributed inner thickening of the lip, has a copious basal deposit or callosity. *H. placentula* Shuttl. is also closely allied, but has two more whorls; is more depressed ("arctispiral"), and more polished. Shuttleworth, in his description of the *H. placentula*, points out its relations to *H. demissa* Binney, and says that it is at once "distinguished from it by the absence of the opake white basal callus," which is found in the latter. He describes *H. placentula* as having the peristome simple and acute, with no mention of internal thickening, which, had it been present, could hardly have escaped his practised eye.

2. Helix barbigera.

Testâ imperforatâ, acutè carinatâ, lenticulari, tenuiusculâ, corneo-fuscâ, epidermide supernè striis asperatâ, quæ ad suturam et carinam in ciliis productæ sunt; basi convexâ; spirâ convexiusculâ; anfractibus 5½ subplanis, ultimo subitò paululum deflexo; aperturâ perobliquâ, transversâ, auriformi, dente modico linguiformi obliquè intrante in toto pariete aperturali coarctatâ; peristomate callosâ, marginibus incrassatis et reflexiusculis, basali subsinuato, integro.

Shell imperforate, sharply carinate, rather thin, dark horn-colored, or brown; the upper surface has the epidermis raised into acute striæ, which, at the suture and carina, are produced into short bristles; these epidermidal striæ are sometimes seen beneath, but less distinctly, being often obsolete in the mature shell; basal surface convex, but indented in the umbilical region; spire slightly convex, whorls five and a half, rather flat, last one suddenly but slightly deflected; aperture very oblique, transverse, ear-shaped, narrowed by a rather slender tongue-shaped tooth, which extends nearly across the whole width of the aperture; peristome callous, margins slightly but distinctly reflected, and thickened within, basal margin slightly arcuate, but entire.

Diam. maj. 10 mill. Diam. min. 9 mill. Alt. 6 mill.

Habitat.—Habersham Co., Georgia, where it was collected by Bishop Elliott.

Observations.—Closely allied to *H. spinosa* Lea, and *H. Edgariana* Lea; but a careful examination of many individuals of the three types led me to concur in the conclusions previously arrived at by Mr. Bland and Mr. Binney, that the three forms are specifically distinct. In size the *H. barbigera* resembles *H. Edgariana*, but is readily distinguished by its much more slender parietal tooth, and by the absence of the notch in the peristome. The notch is usually present also in *H. spinosa*, but that species, like *H. Edgariana*, has the parietal tooth elongated and very strongly developed. Moreover, *H. barbigera* is much smaller than *H. spinosa* (being only about two-thirds its diameter), and has about half a whorl less. The epidermidal striæ are more numerous, more sharply raised, and as a consequence the *cilia* are more numerous than in *H. spinosa*. In the latter the lower lip rises from a deep excavation in the umbilical region, and the parietal tooth is partially curved round the excavation, somewhat over-

XXIX.—*Descriptions of New Species of* ACHATINELLA, *from the Hawaiian Islands.*

By J. T. GULICK. *Read June* 10, 1856.

1. Achatinella leucochila.

Plate VI. Fig. 1.

T. dextrorsâ, imperforatâ, ovato-turritâ, nitidâ, semipellucidâ, corneâ, longitudinaliter creberrime striatâ; apice obtusâ; spirâ turritâ; suturâ anguste marginatâ, modice impressâ; anfr. 7–8, convexiusculis; plicâ columellari sub-basali, albâ; aperturâ sinuato-pyriformi; perist. albido, sub-labiato; margine dextro recto, arcuato; columellari dilatato, albo, adnato; parietali tenuissimo, corneo.

Shell dextral, imperforate, ovately turreted, shining, semipellucid, corneous, with crowded longitudinal striæ; apex obtuse; spire turreted; suture finely margined, moderately impressed; whorls 7–8, somewhat convex; columellar fold sub-basal, white; aperture sinuately pyriform; peristome pallid, with slight callous thickening; dextral margin unreflected, arcuate; columellar margin dilated, white, adnate; parietal margin very thin, corneous.

Length 0.44 inch (11 mill.). Breadth 0.19 inch (4⅘ mill.).
Length of body-whorl 0.26 inch (6⅝ mill.).
Average weight 0.50 grain.

Station.—On the ground. E. Johnson.!

Habitat.—Kauai. E. Johnson.!

Remarks.—Is allied to *A. carneola* Pfr., and *A. cingula* Migh., but is readily distinguished by its more slender form, smaller size, and less convex spire. Its thickened, pallid lip distinguishes it from others of a similar size and form.

2. **Achatinella resinula.**

Plate VI. Fig. 2.

T. dextrorsâ, imperforatâ, cylindraceo-ellipsoideâ, tenuiusculâ, nitidâ, pellucidâ, corneâ, levissime striatâ; apice obtusâ; suturâ simplici, distinctâ, subimpressâ; anfr. 6½ convexiusculis; plicâ columellari subbasali, albâ, lamelliformi; aperturâ subverticali, ellipticâ; perist. simplici; margine dextro recto, regulariter arcuato; columellari dilatato, tenui, adnato; parietali tenuissimo.

Shell dextral, imperforate, cylindrically ellipsoidal, rather thin, shining, pellucid, corneous, very lightly striate; apex obtuse; suture simple, distinct, slightly impressed; whorls 6½, somewhat convex; columellar plait sub-basal, white, lamelliform; aperture nearly vertical, elliptical; peristome simple; with dextral margin regularly curved, unreflected; columellar margin dilated, thin, adnate; parietal margin very thin.

Length 0.50 inch (12⅔ mill.). Breadth 0.23 inch (6 mill.).
Length of body whorl 0.33 inch (8⅓ mill.).
Average weight 1.00 grain.

Var. β.—Shorter, less cylindrical.

which is quite ventricose, with spire more conical, and body whorl encircled with a broad dark girdle.

Only one poor specimen was found in Punaluu.

3. **Achatinella lagena.**

Plate VI. Fig. 3.

T. dextrorsâ, imperforatâ, acuminato-ovatâ, solidulâ, saturate resinaceâ, levissime striatâ; apice obtusulâ, pallidâ; spirâ concavo-conicâ; suturâ simplici, subimpressâ; anfr. 7, convexiusculis; plicâ columellari medianâ, albâ, validâ, lamelliformi; aperturâ truncato-auriformi; perist. albido, vel rubido-sublabiato; margine dextro recto, arcuato; columellari dilatato, albo, adnato; parietali tenui, fusco-corneo.

Shell dextral, imperforate, acuminately ovate, rather solid, dark resinous, very finely striated; apex somewhat obtuse, pallid; spire concavely conical; suture simple, slightly impressed; whorls 7, rather convex; columellar fold central, white, strong, lamelliform; aperture truncately auriform; peristome somewhat labiate, white or reddish; dextral margin unreflected, arcuate; columellar margin dilated, white, adnate; parietal margin thin, dark, corneous.

Average length 0.52 inch (13 mill.).
Breadth 0.26 inch (6⅔ mill.).
Length of body whorl 0.35 inch (9 mill.).
Average weight 1.65 grains.

Var. b.—Small. Length 0.40 inch (10 mill.). Breadth 0.21 inch (5⅓ mill.). Length of body whorl 0.29 inch (7⅓ mill.).

Var. c.—Light corneous, thinner, with lip but slightly thickened. We have but one specimen.

Station.—On the ground. J. T. G.!

Habitat.—Helemanu, Wahiawa, and Kalaikoa, Oahu. J. T. G.!

Remarks.—A neat, flask-shaped species, forming an intermediate link between *A. fumosa* Newc. and *A. labiata* Newc. In color, structure, and general form, it resembles the former; the latter, in the concave outlines of the spire and the form of the upper whorls; while the lip is not so thin as in *A. fumosa*, nor so thick and callous as in *A. labiata.*

4. Achatinella lacrima.

Plate VI. Fig. 4.

T. dextrorsâ, imperforatâ, ovato-conicâ, nitidâ, corneâ, levissime striatâ; apice subacutâ, pallidâ; spirâ conicâ; anfr. 7, planiusculis; plicâ columellari medianâ, albâ, validâ, lamelliformi, transversâ; aperturâ truncato-auriformi; perist. intus albo-incrassato; margine dextro recto, arcuato; columellari dilatato, adnato; parietali tenuissimo.

Var. b.—With a rather broad, faint, brown band encircling the body whorl, and revolving above the suture.
Var. c.—With faint reddish sutural band.

Station.—On the ground in the woods. J. T. G.!

Habitat.—Most of our specimens are from Lihue, Oahu, but Kalaikoa, Wahiawa, Helemanu, and Peula, have each furnished one or two specimens. J. T. G.!

Remarks.—It has been known in some collections as the young of *A. labiata* Newc., but a comparison with the true young of that species can leave no doubt in regard to its distinct character. The specimen figured has the lip considerably thickened, and is evidently full grown; but if, as has been maintained, a more perfect maturity should render the lip as callous as in *A. labiata*, it will be seen that the form is quite distinct; the spire being shorter, and the body whorl inflated.

In size, form, and character of lip, it is more nearly allied to *A. dimidiata* Pfr., which is readily known by its peculiar arrangement of colors.

5. **Achatinella costulata.**

Plate VI. Fig. 5.

T. dextrorsâ, imperforatâ, turrito-oblongâ, micante, sericeâ, saturate corneâ, fasciâ pallidâ spirali ornatâ, minute regulariter costatâ; spirâ turritâ, apice obtusâ, pallidâ; suturâ simplici, modice impressâ; anfr. 7, convexis; plicâ columellari medianâ, fuscâ; aperturâ pyriformi; perist. simplici; margine dextro recto, pallido, substricte descendente, leviter antrorsum arcuato; columellari tenui, fusco, adnato; parietali tenuissimo, albo.

Shell dextral, imperforate, turreted oblong, shining, silky, dark corneous, with a pale spiral band cutting the body whorl, and revolving above the suture, minutely regularly ribbed; spire turreted, with pale, obtuse apex; suture simple, moderately impressed; whorls 7, convex; columellar fold central, brown; aperture pyriform; peristome simple; with dextral margin unreflected, pale, laterally compressed, slightly arcuate anteriorly; columellar margin thin, brown, aduate; parietal margin very thin, white.

Length 0.33 inch (8⅓ mill.). Breadth 0.14 inch (3½ mill.).
Length of body whorl 0.19 inch (5 mill.).
Average weight 0.30 grain.

Station.—On the ground in the woods. J. T. G.!

Habitat.—Pupukea, Waimea, and Kawailoa, Oahu. J. T. G.!

Remarks.—A rare and delicate species, so finely and regularly ribbed and perfectly polished, as to give it a glistening, silky appearance.

This species presents a new and very interesting form of the subgenus Leptachatina (Gould).

It seems to be more nearly allied to *A. striatella* Nob., which

Shell dextral, imperforate, ovately turreted, rather thin, scarcely shining, dark brown, corneous, finely and rather regularly striated; apex somewhat obtuse, suture simple, moderately impressed; whorls 6½, convex; columellar fold central, brown or white; aperture vertical, truncately oval; peristome simple; with dextral margin unreflected, arcuate; columellar margin dilated, thin, white, adnate; parietal margin wanting.

Length 0.39 inch (10 mill.). Breadth 0.17 inch (4½ mill.).
Length of body whorl 0.23 inch (6 mill.).
Average weight 0.50 grain.

Station.—Among dead leaves, in damp places. J. T. G.!

Habitat.—On the mountain ridge of Keawaawa, Oahu. J. T. G.!

Remarks.—A very dark-brown, turreted species, nearly allied to *A. fusca* Newc., which it resembles in its striated surface and corneous structure. *A. fusca* is, however, broader at the base, with a shorter spire, and usually of a lighter color, with a single dark band; but we have one specimen of a dark corneous color throughout, which shows an evident affinity with this species.

It is found near the eastern extremity of the mountain ridge which forms the back-bone of the island. Its distribution is very limited, there being but little vegetation in that region.

7. Achatinella marginata.

Plate VI. Fig. 7.

T. dextrorsâ, imperforatâ, ovatâ, nitidâ, semipellucidâ, corneâ, fasciâ fuscâ diffusâ ornatâ, tenuissime striatâ; apice obtusâ; spirâ convexo-conicâ; anfr. 6, convexiusculis; ultimo superne valide marginato; plicâ

columellari medianâ, levi, fuscâ; aperturâ lunato-rotundatâ; perist. simplici; margine dextro recto, albido, obtuso, arcuato; columellari dilatato, fusco, adnato; parietali tenuissimo, vitreo.

Shell dextral, imperforate, ovate, shining, semipellucid, corneous, with a diffused brown band, very finely striated; apex obtuse; spire convexly conical; whorls 6, somewhat convex; the last strongly margined above; columellar fold central, not strongly developed, brown; aperture lunately rounded; peristome simple; with dextral margin unreflected, whitish, obtuse, arcuate; columellar margin dilated, brown, adnate; parietal margin very thin, vitreous.

Length 0.37 inch (9⅓ mill.). Breadth 0.19 inch (5 mill.).
Length of body whorl 0.25 inch (6⅓ mill.).
Weight 0.60 grain.

Station.—On the ground. J. T. G.!

Habitat.—Kalaikoa.—Oahu. J. T. G.!

Remarks.—The most striking character of this species is the polish, of a brown succineous color, and very finely striated; apex subacute; spire convexly-conical; suture simple, lightly impressed; whorls 6, somewhat convex; columella a little oblique, white, and plicately truncated; aperture truncately oval; peristome simple, with dextral margin unreflected, acute, arcuate; columellar margin dilated, thin, white.

Length 0.33 inch (8⅓ mill.); breadth 0.17 inch (4⅓ mill.).
Length of body whorl 0.21 inch (4⅛ mill.).
Weight 0.25 grain.

Station.—On the ground. J. T. G.!

Habitat.—Mountain forests of Mokuleia, Oahu. J. T. G.!

Remarks.—Cannot be compared with any species yet described. Resembles somewhat *A. succinea* Nob., but has not the glassy polished appearance of that species.

9. Achatinella fumida.

Plate VI. Fig. 9.

T. dextrorsâ, imperforatâ, ovato-conicâ, tenui, nitidâ, pellucidâ, corneâ, sub lente levissime striatâ; apice obtusulâ, pallidâ; spirâ convexo-conicâ; suturâ simplici, vix impressâ, fusco-lineatâ; anfr. 7, subplanis; plicâ columellari medianâ, albâ, lamelliformi; aperturâ pyriformi; perist. simplici, margine dextro recto, semicirculari; columellari dilatato, albo, adnato; parietali tenuissimo, albo.

Shell dextral, imperforate, ovate conic, thin, shining, pellucid, corneous, with a dark line accompanying the suture, microscopically very finely striated; apex somewhat obtuse, pallid; spire convexly conical; suture simple, scarcely impressed; whorls 7, rather flat; columellar fold central, white, lamelliform; aperture pyriform; peristome simple; with dextral margin unreflected, semicircular; columellar margin dilated, white, adnate; parietal margin very thin, white.

Length 0.31 inch (8 mill.). Breadth 0.17 inch (4⅓ mill.).
Length of body whorl 0.21 inch (5⅓ mill.).
Average weight 0.35 grain.

Var. b.—Without the dark sutural line.

Station.—On the ground in the woods. J. T. G.!

Habitat.—Waialei, Pupukea, Waimea, Kawailoa, and Helemanu, Oahu. J. T. G.!

Remarks.—One of a numerous group of little glassy shells represented by *A. nitida* Newc., and *A. grana* Newc., though not so nearly allied to these two, which are from Maui, as to *A. gummea* Nob., which is found in other districts of Oahu. From that species it differs, however, in its habits, and less inflated form.

10. **Achatinella gummea.**

margined with white and thickened within; with dextral margin arcuate, very slightly reflected anteriorly; columellar margin dilated, adnate; parietal margin thin.

Length 0.30 inch (7⅝ mill.). Breadth 0.17 inch (4⅓ mill.).
Length of body whorl 0.21 inch (5⅓ mill.).
Average weight 0.25 grains.

Var. b.—Of a dark resinous hue, with lip and columella white.

Station.—Under stones, in dry places. Thomas L. Gulick.!

Habitat.—Mokuleia and Lihue, Oahu. Thomas L. Gulick.!

Remarks.—In form it differs from *A. fumida*, being shorter and more inflated; also in station, as it frequents open fields and hill sides, where it lodges beneath stones.

11. Achatinella fragilis.

Plate VI. Fig. 11.

T. dextrorsâ, imperforatâ, ovatâ, tenuissimâ, nitidâ, pellucidâ, vitreâ, pallide succineâ, sub lente levissime striatâ; apice obtusulâ; spirâ convexo-conicâ; suturâ simplici, sub-impressâ; anfr. 6, convexiusculis; columellâ pallide vel fusco-corneâ, sub-truncatâ, vix plicatâ; aperturâ obovatâ; perist. simplici, tenui; margine dextro recto, arcuato; columellari sub-dilatato, corneo, adnato; parietali tenuissimo.

Shell dextral, imperforate, ovate, very thin, shining, pellucid, vitreous, pale amber colored, microscopically very finely striated; spire convexly conical; suture simple, slightly impressed; whorls 6, somewhat convex; columella pale or brown corneous, slightly truncate, scarcely plicate; aperture obovate; peristome simple, thin; dextral margin unreflected, arcuate;

columellar margin slightly dilated, corneous, adnate; parietal margin very thin.

Length 0.30 inch (7⅝ mill.). Breadth 0.15 inch (4 mill.).
Length of body whorl 0.21 inch (5⅛ mill.).
Average weight 0.20 grain.

Station.—On damp ground in the woods. J. T. G.!

Habitat.—Punaluu, Oahu. J. T. G.!

Var. b.—With stronger columellar fold.
Habitat.—Hauula, Oahu. J. T. G.!

Var. c.—A little larger; color, pale amber.
Habitat.—Helemanu, Oahu. J. T. G.!

Remarks.—This species is thinner and more elongate than *A. gummea* Nob., with body whorl not so large, lip not thickened, and columella scarcely plicate.

There is a variety found in Kailua and Waimanalou with stronger columellar fold, and more regularly conic spire.

acute, pallid; spire convexly conic; suture simple, lightly impressed; whorls 6½, rather convex; columellar fold central, white, sublamelliform; aperture sinuately pyriform; peristome scarcely thickened within; with dextral margin unreflected, arcuate; columellar margin dilated, corneous, adnate; parietal margin wanting.

Length 0.33 inch (8½ mill.). Breadth 0.15 inch (4 mill.).
Length of body whorl 0.21 inch (5½ mill.).
Average weight 0.17 grain.

Var. b.—Smaller, more solid, ovate conic, with lip thickened.

Station.—On the ground. J. T. G.!

Habitat.—Keawaawa, Oahu. J. T. G.!

Remarks.—Smaller and more elongately ovate than the preceding.

13. **Achatinella granifera.**

Plate VI. Fig. 13.

T. dextrorsâ, imperforatâ, acuminato-ovatâ, tenui, nitidâ, pellucidâ, vitreâ, sub lente vix striatâ; apice obtusulâ; spirâ convexo-conicâ; suturâ simplici, leviter impressâ; anfr. 6, convexiusculis; columellâ rectâ, verticali, leviter plicatâ; aperturâ subrhombeâ; perist. subincrassato; margine dextro recto, arcuato; columellari dilatato, adnato; parietali tenui.

Shell dextral, imperforate, acuminately ovate, thin, shining, pellucid, vitreous, scarcely striated beneath the lens; apex rather obtuse; spire convexly conical; suture simple, lightly impressed; whorls 6, somewhat convex; columella not arched, vertical, lightly plicate; aperture subrhomboidal; peristome slightly thickened; with dextral margin unreflected, arcuate; columellar margin dilated, adnate; parietal margin thin.

Length 0.27 inch (7 mill.). Breadth 0.13 inch (3⅓ mill.).
Length of body whorl 0.18 inch (4½ mill.).
Average weight 0.10 grain.

Var. b.—Color, claret.

Station.—Under stones on dry hill sides. J. T. G.!

Habitat.—Keawaawa, Oahu. J. T. G.!

Remarks.—*A. grana* Newc. found in the fields of Makawao, E. Maui, is allied; but is smaller, more cylindrical, with aperture more nearly oval, lip and columella white, and umbilical cleft open.

14. Achatinella crystallina.

Plate VI. Fig. 14.

Length of body whorl 0.15 inch (4 mill.).
Average weight 0.11 grain.

Station.—Under stones in open country. T. L. G.!

Habitat.—Mokuleia, Oahu. T. L. G.!

Var. b.—With a brown spiral line accompanying the suture.
Var. c.—Larger, not so transparent.
Habitat.—Kamoo, Waialua, Oahu. T. L. G.!

Remarks.—A clear, shining, transparent species, associated with *A. gummea* Nob., but much smaller and of narrower form.

15. **Achatinella saxatilis.**

Plate VI. Fig. 15.

T. dextrorsâ, perforatâ, cylindraceo-oblongâ, tenui, nitidâ, perpellucidâ, vitreâ, sub lente levissime striatâ; apice obtusulâ; spirâ elongatâ; suturâ simplici, leviter impressâ; anfr. 6, subconvexis; ultimo ad aperturam rotundato; columellâ leviter arcuatâ, pallidâ, plicâ obsoletâ; aperturâ late ovali; perist. simplici, pallide limbato; marginibus conniventibus; dextro recto, arcuato; columellari dilatato, patente; parietali subcalloso.

Shell dextral, perforate, cylindrically oblong, thin, shining, transparent, vitreous, microscopically very finely striated; apex rather obtuse; spire elongate; suture simple, lightly impressed; whorls 6, slightly convex; the last rounded towards the aperture; columella slightly arcuate, pallid, with fold obsolete; aperture broadly oval; peristome simple, bordered with white; with margins joining in an unbroken curve; dextral margin unreflected, arcuate; columellar margin dilated, not appressed; parietal margin slightly callous.

Length 0.25 inch (6¼ mill.). Breadth 0.11 inch (2¾ mill.).
Length of body whorl 0.14 inch (3½ mill.).
Average weight 0.11 grain.

Station.—Under stones in the open fields. T. L. G.!

Habitat.—Mokuleia, Oahu. T. L. G.!

Remarks.—A small cylindrical species, of clear glassy appearance, resembling a Bulimus in aperture and columella, bu nevertheless a true Achatinella, as its affinity to *A. crystallin* Nob. indicates. It represents more nearly than any other th Oahu species, the *A. grana* Newc. (found on E. Maui), fro which it differs chiefly in its larger size, more elongate form and glassy transparency. From *A. crystallina* it differs i slender form and smooth columella with umbilical cleft.

16. **Achatinella exilis.**

Plate VI. Fig. 16.

ate; columellar margin dilated, thin, vitreous, not appressed; parietal margin wanting.

Length 0.25 inch (6⅓ mill.). Breadth 0.10 inch (2½ mill.).
Length of body whorl 0.15 inch (4 mill.).
Average weight 0.09 grain.

Station.—Under stones in places not shaded by trees. J.T.G.!

Habitat.—Keawaawa, Oahu. J. T. G.!

Remarks.—A slender, delicate, and gracefully formed species, with which I introduce the following turreted group, though it seems to be more nearly allied in its affinities to *A. triticea* Nob., which I have placed in the preceding group.

17. **Achatinella petila.**

Plate VI. Fig. 17.

T. dextrorsâ, perforatâ, ovato-turritâ, tenuiusculâ, impolitâ, fusco-corneâ, oblique striatâ; apice obtusulâ, pallidâ; spirâ turritâ; suturâ simplici, bene impressâ; anfr. 6, convexis; columellâ verticali, fuscâ, intus levissime plicatâ; aperturâ verticali, subellipticâ; perist. simplici; marginibus conniventibus; dextro recto, arcuato; columellari subreflexo, patente; parietali angusto, calloso.

Shell dextral, perforate; turreted, rather thin, not polished, brown, corneous, obliquely striated; apex somewhat obtuse, pallid; spire turreted; suture simple, well impressed; whorls 6, convex; columella vertical, brown, lightly plaited deep within the aperture; aperture vertical, subelliptical; peristome simple, with margins joining in an unbroken curve; dextral margin unreflected, arcuate; columellar margin slightly reflected, not appressed; parietal margin narrow, callous.

Length 0·26 inch (6⅔ mill.). Breadth 0.11 inch (2¾ mill.).

Length of body whorl 0.14 inch (3½ mill.).
Average weight 0.09 grain.

Station.—Under stones. J. T. G.!

Habitat.—Dry rocky regions of Koko on the eastern end of Oahu. J. T. G.!

Remarks.—A small unpretending species quite unlike any heretofore described. In structure and in the character of the upper whorls it somewhat resembles *Bulimus Sandwicensis* Pfr.; but it is much smaller, with fewer whorls, and has a plaited columella. It is more closely allied to *A. octogyrata* Nob., which inhabits the damp wooded regions of Palolo, and is a larger species with more numerous whorls.

18. **Achatinella octogyrata.**

Plate VI. Fig. 18.

Length 0.30 inch (7⅝ mill.). Breadth 0.14 inch (3½ mill.).
Length of body whorl 0.17 inch (4¼ mill.).
Average weight 0.17 grain.

Station.—On the ground. J. T. G.!

Habitat.—Palolo valley, Oahu. J. T. G.!

Remarks.—It is found with *A. subula* Nob., and is allied to t, but is smaller, thinner, and less polished, with spire less rawn out, and columella not so strongly plaited.

19. Achatinella subula.

Plate VI. Fig. 19.

T. dextrorsâ, imperforatâ, subulatâ, tenui, nitidâ, translucidâ, fusco-rneâ, levissime striatâ; apice obtusâ, pallidâ; spirâ turritâ; suturâ mplici, impressâ; anfr. 9, convexis; plicâ columellari medianâ, albâ; erturâ sinuato-lunatâ; perist. simplici; margine dextro recto, arcuato; lumellari dilatato, albo, adnato; parietali nullo.

Shell dextral, imperforate, elongate, thin, shining, translu-ent, dark corneous, very finely striated; apex obtuse, whitish; pire turreted; suture simple, impressed; whorls 9, convex; olumellar fold central, white; aperture sinuately lunate; peri-tome simple; with dextral margin unreflected, arcuate; colu-mellar margin dilated, white, adnate; parietal margin wanting.
Length 0.45 inch (11½ mill.). Breadth 0.17 inch (4¼ mill.).
Length of body whorl 0.23 inch (6 mill.).
Average weight 0.60 grain.

Station.—On the ground. J. T. G.!

Habitat.—Palolo valley, Oahu. J. T. G.!

Remarks.—*A. gracilis* Pfr. is the most nearly allied form heretofore described. But it cannot be confounded with that species, for it is darker, thinner, of more clear corneous structure, and never furnished with brown bands. For its distinctive characters as compared with *A. octogyrata* Nob. see remarks on that species.

20. **Achatinella turrita.**

Plate VI. Fig. 20.

T. dextrorsâ, imperforatâ, ovato-turritâ, tenuiusculâ, nitidâ, translucidâ, fusco-corneâ, striatulâ; apice obtusâ, pallidâ; spirâ turritâ; suturâ simplici, leviter impressâ; anfr. fere 9, plano-convexis; plicâ columellari mediocri, albidâ; aperturâ rotundato-lunatâ; perist. simplici; margine dextro recto, arcuato; columellari dilatato, tenui, adnato; parietali nullo.

Shell dextral, imperforate, ovately turreted, rather thin, shining, translucent, dark corneous, finely striated; apex obtuse, pallid; spire turreted; suture simple, lightly impressed;

21. **Achatinella terebralis.**

Plate VI. Fig. 21.

dextrorsâ, imperforatâ, turritâ, nitidâ, saturate fuscâ, corneâ,
sime striatâ; apice obtusâ, albâ; spirâ turritâ; suturâ simplici,
mpressâ; anfr. 7½, plano-convexis; columellâ albâ, modice plicatâ;
rturâ lunatâ; perist. pallido; margine dextro recto, leviter incras-
; columellari dilatato, adnato; parietali tenui.

Shell dextral, imperforate, turreted, shining, dark brown, cor- ous, very finely striated; apex obtuse, white; spire turreted; ture simple, slightly impressed; whorls 7½, flatly convex; olumella white, moderately plaited; aperture lunate; peristome whitish; with dextral margin unreflected, somewhat thickened; columellar margin dilated, adnate; parietal margin thin.

Length 0.44 inch (11 mill.). Breadth 0.18 inch (4½ mill.).
Length of body whorl 0.24 inch (6 mill.).
Weight 0.50 grain.

Var. b.—With spire shortened, concavely conical; body whorl rounded.

Station.—On the ground in the woods. J. T. G.!

Habitat.—Kawailoa, Oahu. J. T. G.!

Remarks.—Resembles *A. turrita* and *subula* Nob., but is icker and heavier than either, and has fewer whorls. The orter variety seems to revert towards the form of *A. lagena* ob., which in geographical relation is within five or six miles, d in affinity is probably more nearly allied to this, than are *turrita* and *A. subula*, found in more distant parts of the and. The number of its whorls and its thicker structure vor this opinion.

22. Achatinella stiria.

Plate VI. Fig. 22.

T. dextrorsâ, rimatâ, elongatâ, tenui, nitidâ, pellucidâ, vitreâ, levissime striatâ; apice obtusâ; spirâ turritâ; suturâ simplici, subimpressâ; anfr. 6½, convexiusculis; columellâ intus levissime plicatâ; aperturâ pyriformi; perist. simplici, tenui; margine dextro recto, leviter arcuato; columellari reflexo, patente; parietali tenuissimo, vitreo.

Shell dextral, perforate, elongate, thin, shining, pellucid, vitreous, very finely striated; apex obtuse; spire turreted; suture simple, slightly impressed; whorls 6½, somewhat convex; columella very lightly plaited deep within the aperture; aperture pyriform; peristome simple, thin; with dextral margin unreflected, lightly arcuate; columellar margin reflected, not appressed; parietal margin very thin, vitreous.

Length 0.28 inch (7 mill.). Breadth 0.11 inch (2¾ mill.).

Length of body whorl 0.16 inch (4 mill.)

Average weight 0.10 grain.

suturâ simplici, modice impressâ; anfr. fere 7, convexiusculis; columellâ pallide corneâ, intus leviter plicatâ; aperturâ pyriformi; perist. simplici; margine dextro recto, arcuato; columellari angusto, adnato; parietali nullo.

Shell dextral, imperforate, elongately ovate, thin, shining, pellucid, vitreous, microscopically finely striated; apex rather obtuse; spire convexly conic; suture simple, moderately impressed; whorls nearly 7, somewhat convex; columella lightly plaited deep within the aperture; aperture pyriform; peristome simple; with dextral margin unreflected, arcuate; columellar margin narrow, adnate; parietal margin wanting.

Length 0.32 inch (8 mill.). Breadth 0.14 inch (3½ mill.).
Length of body whorl 0.18 inch (4½ mill.).
Average weight 0.17 grain.

Station.— . . . ? Undoubtedly on the ground.

Habitat.—Hawaiian Islands.!

Remarks.—Resembles *A. triticea* Nob., but differs in its clear glassy appearance, and nearly obsolete columellar fold.

24. **Achatinella parvula.**

Plate VI. Fig. 24.

T. dextrorsâ, imperforatâ, conico-oblongâ, tenui, nitidâ, pellucidâ, succineo-vitreâ, sub lente levissime striatâ; apice obtusâ; spirâ convexo-conicâ; suturâ simplici, modice impressâ; anfr. 6, convexiusculis; columellâ intus levissime plicatâ; aperturâ pyriformi; perist. simplici, recto; margine columellari angusto, adnato; parietali nullo.

Shell dextral, imperforate, conic-oblong, thin, shining, pellucid, glassy, of amber hue, microscopically very finely striated;

apex obtuse; spire convexly conical; suture simple, moderately impressed; whorls 6, rather convex; columella with a light internal plait; aperture pyriform; peristome simple, unreflected; with columellar margin narrow, adnate; parietal margin wanting.

Length 0.25 inch (6⅛ mill.). Breadth 0.12 inch (3 mill.).
Length of body whorl 0.16 inch (4 mill.).
Average weight 0.10 grain.

Station.— . . . ? Undoubtedly on the ground.

Habitat.—Hawaiian Islands.!

Remarks.—Nearly of the size and color of *A. granifera* Nob., but of a more cylindrically oblong shape, with narrower base.

25. Achatinella platystyla.

Plate VI. Fig. 25.

dextral margin anteriorly reflected, arcuate; columellar margin broadly reflected, flattened, not appressed; parietal margin very thin.

Length 0.80 inch (20⅓ mill.); breadth 0.41 inch (10⅔ mill.).
Length of body whorl 0.55 inch (14 mill.).
Weight 4.50 grains.

Station.— . . . . ?
Habitat.—Kawailoa, Oahu. J. T. G.!

Remarks.—A rare mouse-colored species, in affinity nearly allied to *A. dubia* Newc., but in color bearing a striking resemblance to *A. glabra* Newc., a shell of quite another group, found in the same locality with this.

26. **Achatinella pexa.**

Plate VI. Fig. 26.

T. sinistrorsâ, profunde perforatâ, ovato-conicâ, tenui, nitidâ, striatulâ, sub lente obsoletissime decussatâ, cinereâ, albido et fusco-strigatâ, lineis fuscis spiralibus ornatâ; apice subacutâ; spirâ conicâ; suturâ simplici, subimpressâ; anfr. 6, convexiusculis; columellâ albâ, obsolete plicatâ; aperturâ obliquâ, truncato-ovali, intus albido-fuscâ; perist. vix incrassato; margine externo antice reflexo, arcuato; columellari dilatato, patente; parietali nullo.

Shell sinistral, deeply perforated, ovate-conic, thin, shining, finely striated, microscopically very minutely decussated; ash-colored, streaked with white and brown, and banded with brown spiral lines; apex subacute; spire conical; suture simple, slightly impressed; whorls 6, somewhat convex; columella white, obsoletely plaited; aperture oblique, truncately oval, light brown within; peristome scarcely thickened within; with external margin anteriorly reflected, arcuate; columellar margin dilated, not appressed; parietal margin wanting.

Length 0.76 inch (19⅓ mill.); breadth 0.42 inch (10⅔ mill.).
Length of body whorl 0.53 inch (13½ mill.).
Weight 2.50 grains.

Station.— . . . . ?
Habitat.—Hawaiian Islands. J. T. G. !

Remarks.—Somewhat resembles *A. Buddii* Newc. in style of coloring, but lacks the black tip of that species, and decidedly differs in the reflected lip, and deeply perforated umbilicus.

27. **Achatinella lactea.**

Plate VI. Fig. 27.

T. sinistrorsâ, perforatâ, acuminato-ovatâ, solidâ, striatulâ, sub lente levissime decussatâ, eburneâ; apice acutâ; spirâ conicâ, leviter convexâ; suturâ marginatâ, subimpressâ; anfr. 6½, plano-convexis; plicâ columellari medianâ, fuscâ, validâ; aperturâ obliquâ, sinuato-ovali, intus rubido-fuscâ; perist. albo, intus incrassato; margine externo antice subreflexo, arcuato; columellari dilatato, subpatente: parietali tenui.

Habitat.—Lanai, one of the Hawaiian Islands. S. T. Alexander. !

Remarks.—A rare shell allied to *A. variabilis* Newc., but well characterized as a distinct species.

28. **Achatinella eburnea.**

Plate VI. Figs. 28 *a* and 28 *b*.

T. sinistrorsâ, plerumque perforatâ, ovato-conicâ, solidulâ, nitidâ, striatâ, minutissime decussatâ, eburneâ; apice acutiusculâ; spirâ concavo-conicâ; suturâ submarginatâ, leviter impressâ; anfr. 6, subconvexis; ultimo magno, oblique producto, supra aperturam angulato; plicâ columellari medianâ, albâ, validâ, fere transversâ: aperturâ obliquâ truncato-auriformi, intus albâ: perist. intus incrassato; margine externo antice reflexo, arcuato; columellari dilatato, subpatente; parietali nullo.

Shell sinistral, usually perforate, ovate-conic, somewhat solid, shining, striated, very minutely decussated, ivory white; apex rather acute; spire concavely conical; suture slightly margined, lightly impressed; whorls 6, slightly convex; the last large, obliquely produced, and angulated above the aperture; columellar fold central, white, strong, nearly transverse; aperture oblique, truncately auriform, white within; peristome thickened; with external margin reflected anteriorly, arcuate; columellar margin dilated, slightly detached; parietal margin wanting.

Length 0.95 inch (24 mill.); breadth 0.54 inch (14 mill.).
Length of body whorl 0.66 inch (17 mill.).
Average weight 9.00 grains; greatest weight 13.00 grains.

Station.—On the trunks of trees, quite exposed. E. Bailey. !
Habitat.—Honuaula, E. Maui. E. Bailey. !

Var. b.—Brownish yellow, with a white girdle on the periphery of the last whorl, waved with white and yellow on the third whorl.

Var. c.—With body whorl rounded, not angulated.

Remarks.—This species is the analogue of *A. Tappaniana* C. B. Ad. found on W. Maui, but differs from it in its more ventricose form, its angulated body whorl, and more regularly curved lip, besides the difference in coloring.

29. **Achatinella ampulla.**

Plate VII. Fig. 29.

T. sinistrorsâ, interdum subperforatâ, elongatâ, subpyriformi, tenuiusculâ, nitidâ, striatulâ, sub lente vix decussatulâ, albâ, fasciâ castaneâ latâ basi cingente, et intus aperturam infra suturam volvente, interdum superne lineatâ; apice subacutâ; spirâ concavo-conicâ, interdum decollatâ; anfr. 6½, convexis, superne marginatis; ultimo inflato, $\frac{86}{100}$ longitudinis æquante; columellâ albâ, superne plicatâ, valde intortâ, non tuberculatâ; aperturâ rotundatâ; perist. expanso, reflexo, vix incrassato; margine columellari reflexo, adnato vel subpatente; parietali nullo.

Shell sinistral, sometimes slightly perforate, elongate, subpyriform, rather thin, shining, finely striate, scarcely decussate

Remarks.—This species differs from *A. fasciata* Nob. to which it is closely allied, in the concave outlines of the spire, in its inflated body whorl, and more expanded and reflected lip.

30. **Achatinella fasciata.**

Plate VII. Fig. 30.

T. sinistrorsâ, interdum perforatâ, ovato-conicâ, solidulâ, nitidâ, striatulâ, sub lente vix decussatulâ, albâ, fusco tæniolatâ; apice subacutâ, albâ, tæniâ fuscâ supra suturam cinctâ; spirâ regulariter conicâ; anfr. vel 7, convexis, non marginatis; ultimo rotundato, $\frac{65}{100}$ longitudinis æquante; plicâ columellari albâ, superâ, levi, subtortâ; aperturâ parum obliquâ, rotundato-ovali, intus albâ, interdum pallide fuscâ infra externas fascias; perist. albo, sub-incrassato, antice subreflexo; margine columellari reflexo, vix adnato; parietali nullo.

Shell sinistral, sometimes perforate, ovate-conic, solid, shining, finely striated, microscopically very minutely and faintly decussated, white, with brown bands; apex subacute, white, with a brown line above the suture; spire regularly conical; whorls 6 or 7, convex, not margined; the last rounded, equal to $\frac{65}{100}$ of the length; columellar fold white, superior, slightly developed, moderately twisted; aperture somewhat oblique, roundly oval, white within; the bands sometimes appear in pale brownish stripes on the inner surface; peristome white, slightly thickened, subreflected anteriorly; with columellar margin reflected, scarcely adnate; parietal margin wanting.

Average length 0.87 inches (22 mill.); greatest length 0.97 inch (25 mill.); breadth 0.45 inch (11½ mill.).

Length of aperture, 0.39 inch (10 mill.).

Average weight 6.80 grains; greatest weight 9.00 grains; least weight, 6.00 grains.

Var. b.—Thicker and more elongate, with dark brown or black bands; lip well thickened within, and deeply colored on the edge opposite the bands; columella slightly toothed.

Var. c.—Ventricose, conical: one specimen has the following dimensions: length 0.86 inch; breadth 0.54 inch; length of aperture, 0.40 inch.

Station.—On the Wiliwili (*Erythrina monosperma*). S. T Alex.!

Habitat.—Honukawai, Maui. S. T. Alex.!

Remarks.—Has been confounded with *A. Tappaniana* a *A. splendida* Newc., but is smaller than the former, wi fainter sculpturing and more regularly conical spire; it al differs in its dark bands, rounded body whorl, less reflected l and slight columellar fold. It resembles *A. splendida* Ne in its brown bands, but is otherwise quite distinct. A nucle character which distinguishes it from either of the above, is th spiral line on the first whorls.

subacute, tessellated, spire conic with slightly convex outlines; whorls $6\frac{1}{2}$ or 7, moderately convex, scarcely margined; body whorl regularly rounded, equal to $\frac{6}{10}$ of the length; columellar fold pale violet, strong, superior; aperture somewhat oblique, not expanded, roundly semioval, very pale violet within; peristome scarcely reflected, thickened within; with columellar margin reflected, not impressed; parietal margin wanting.

Length 0.85 inch ($21\frac{3}{5}$ mill.); breadth 0.50 inch. ($12\frac{2}{3}$ mill.).
Length of aperture 0.40 inch (10 mill.).
Average weight 7.0 grains.

The dimensions of a large specimen are as follows:
Length 1.00 inch ($25\frac{3}{5}$ mill.); breadth 0.53 inch ($13\frac{1}{2}$ mill.).
Length of aperture 0.45 inch ($11\frac{2}{5}$ mill.).
Weight 7 grains.

Var. b.—Regularly conical, rather broad at the base; with spire shortened; whorls nearly 7, convex, not margined; aperture very oblique, semiorbicular, pale blue within.

Length 0.75 inch (17 mill.); breadth 0.51 inch (13 mill.).
Length of aperture 0.34 inch ($8\frac{2}{3}$ mill.).
Weight 6.00 grains.

Var. c.—Ovate-conic, marble grey, bands usually wanting, within the aperture pale lilac, whorls somewhat swollen beneath the sutures, columella not so short. This variety passes into the white variety of *A. splendida* Newc.

Var. d.—Lightly tinged with pink both within and without.

Station.—On trees. Ed. Bailey Jr.!

Habitat.—Wailuku mountain, Maui. Ed. Bailey Jr.!

Remarks.—Dr. Newcomb pronounces this to be a variety of his *A. splendida*, but I think the differences too well marked for a doubt in regard to its distinct character.

32. **Achatinella pyramidalis.**

Plate VII. Fig. 32.

T. dextrorsâ, raro sinistrorsâ, imperforatâ, pyramidali, solidulâ, nitidâ, castaneâ vel cinereo-fuscâ, basi fasciâ 1 albidâ vel luteolâ cinctâ, in anfr. 2 et 3 signis obliquis albidis et fuscis pictâ, intus aperturam cæruleo-albidâ; apice subacutâ; spirâ regulariter conicâ, interdum decollatâ; anfr. 6½, convexis, albo-marginatis, subtiliter transversim striatis, et sub lente lineis spiralibus impressis rugosis minutissime decussatis; ultimo regulariter rotundato, $\frac{65}{100}$ longitudinis æquante; plicâ columellari albâ, validâ, obliquâ; aperturâ parum obliquâ, semiovali; perist. intus incrassato, vix reflexo; margine columellari dilatato, adnato vel subpatente; parietali nullo.

Shell dextral, very rarely sinistral, imperforate, pyramidal, rather solid, shining, chestnut or ash-brown, with a white or yellowish band encircling the base, with oblique white and brown markings on the second and third whorls, bluish-white within the aperture; apex subacute; spire regularly conical, sometimes decollated; whorls 6½, convex, margined with white;

Remarks.—This shell differs from the *A. splendida* Newc., in its smaller size and pyramidal form, with spire less convex, body whorl less ventricose, aperture smaller and less oblique, lip less expanded and reflected. It also differs in being without perforation, and is very rarely sinistral.

The *A. perdix* Reeve, differs from this in its broader and more ventricose form, its more convex spire, with whorls more swollen, with aperture broader, and frequently subangulated; the arrangement of colors is also different. Looking only at the type of this species, it would be placed in the same group with *A. splendida*, yet it is so closely connected by intermediate varieties with *A. perdix*, that it has hitherto been considered a variety of that species.

Var. b.—With black basal band. A small specimen has the following dimensions:

Length 0.80 inch; breadth 0.43 inch; length of aperture, 0.35 inch; weight 4.00 grs.

Var. c.—Without band. I have a small specimen of the brown variety of *A. splendida* Newc., which closely resembles this.

Var. d.—With apex chestnut-brown, not tessellated:—very rare.

Var. e.—With irregular white spots. This variety passes into *A. perdix.*

Station.—On trees.

Habitat.—Lahaina, Maui. S. T. Alex.!

33. **Achatinella undosa.**

Plate VII. Fig. 33.

T. dextrorsâ, profunde anguste umbilicatâ, vel perforatâ, acuminato-ovato-conicâ, solidâ, nitidâ, striatulâ, sub lente obsoletissime decussatulâ, plumbeâ, coloribus nigris, fuscis et albidis strigatâ et undulatâ; a subacutâ, albido et castaneo tessellatâ; spirâ conicâ; anfr. 6½, supe tumidiusculis, submarginatis, ultimo $\frac{65}{100}$ longitudinis æquante; colum albâ, modice plicatâ; aperturâ parum obliquâ, sinuato-ovali; perist. i incrassato, antice subreflexo; margine columellari dilatato, pate parietali nullo.

Shell dextral, deeply, narrowly umbilicate or perforate, a minately ovate-conic, solid, shining, finely striated and mic scopically very faintly decussated, lead grey, streaked a waved with black, brown, and white; apex subacute, tessella with white and chestnut; spire conic; whorls 6½, somew swollen above, slightly margined; the last equal to $\frac{65}{100}$ of length; columella white, moderately plicate; aperture som what oblique, sinuously oval; peristome thickened with slightly reflected anteriorly; with columellar margin dilat unattached; parietal margin wanting.

Length 0.90 inch (23 mill.); breadth 47 inch (12 mill.).
Length of aperture 0.42 inch ($10\frac{2}{3}$ mill.).
Average weight 5.50 grains.

The dimensions of a large specimen are as follows:

Var. e.—Finely and faintly streaked with whitish lines.

Var. f.—Whitish marble grey; lip, columella, and fauces ivory white.

Var. g.—Exterior ashy, without polish; lip ivory white; columella plicate: passes into *A. induta* Nob.

Var. h.—Variegated with black, white, and brown, perforate, columella more distinctly plicate: passes into *A. perdix* Reeve.

Station.—On the Ilima (*Sida*), Kī (*Cordyline terminalis*), and other low bushes. E. Bailey.!

Habitat.—Mountain ridges of Waihee, Maui. E. Bailey. !

Remarks.—This species is smaller in size, and more acuminate in form than *A. perdix*, and differs in having the umbilicus open and deeply perforated, and the columellar fold less prominent.

34. **Achatinella induta.**

Plate VII. Figs. 34 *a* and 34 *e*.

T. dextrorsâ, perforatâ, conico-ovatâ, solidâ, impolitâ, sub lente minutissime et obsoletissime decussatâ, fuscâ; apice subacutâ, albido et castaneo tessellatâ; spirâ convexo-conicâ; suturâ leviter impressâ, non marginatâ; anfr. 6, sub-convexis; ultimo $\frac{66}{100}$–$\frac{72}{100}$ longitudinis æquante; plicâ columellari validâ, albâ, fere transversâ; aperturâ parum obliquâ, sinuato-ovali, intus cæruleo-albâ; perist. intus incrassato, antice subreflexo; margine columellari dilatato, albo, patente; parietali tenuissimo, vel nullo.

Shell dextral, perforate, conic-ovate, solid, unpolished, microscopically very minutely and obsoletely decussated, brown; apex subacute, tessellated with white and chestnut; spire convexly conical; suture lightly impressed, not margined; whorls 6, slightly convex; the last equal to $\frac{66}{100}$–$\frac{73}{100}$ of the whole length; columellar fold strong, white, nearly transverse; aperture slightly oblique, sinuously oval, bluish white within; peristome thickened within; with anterior margin slightly reflected; columellar margin dilated, white, unattached; parietal margin very thin, or wanting.

Length 0.83 inch (21 mill.); breadth 0.50 inch (12⅔ mill.).
Length of aperture 0.40 inch (10 mill.).
Average weight 6.70 grains.

Var. b.—Ash-brown, with whitish streaks and spots. This variety passes into *A. undosa* Nob.

Var. c.—With a white band on the periphery of the last whorl: very rare.

Var. d.—Small, ovate-conic. The dimensions of one of the smallest specimens are as follows:

Length 0.70 inch (18 mill.). Breadth 0.40 inch (10 mill.).
Length of aperture 0.34 inch (8⅔ mill.).
Weight 4.00 grains.

Var. e.—Lip considerably expanded and reflected, slightly

Remarks.—This species is characterized by its unpolished brown exterior.

35. **Achatinella lignaria.**

Plate VII. Fig. 35.

T. dextrorsâ, perforatâ, ovato-conicâ, solidâ, magis minusve nitidâ, sub lente minutissime decussatâ, luteo-eburneâ, interdum strigatâ; apice subacutâ, albâ, luteo oblique notatâ; spirâ regulariter conicâ; suturâ modice impressâ, vix marginatâ; anfr. 6½, convexiusculis; ultimo $\frac{44}{100}$ longitudinis æquante; plicâ columellari validâ, albâ; aperturâ parum obliquâ, sinuato-ovali; peris. incrassato, interdum antice subexpanso et subreflexo; margine columellari dilatato, albo, patente; parietali nullo.

Shell dextral, perforate, ovate-conic, solid, more or less shining, microscopically minutely decussated, yellowish ivory-white, sometimes streaked; apex subacute, white, obliquely marked with brownish yellow; spire regularly conical; suture moderately impressed, scarcely margined; whorls 6½, somewhat convex; the last equal to $\frac{44}{100}$ of the length; columellar fold strong, white; aperture somewhat oblique, sinuously oval; peristome thickened, sometimes slightly expanded and reflected anteriorly; columellar margin dilated, white, unattached; parietal margin wanting.

Length 0.80 inch (20⅓ mill.); breadth 0.41 inch (10⅜ mill.).
Length of aperture 0.35 inch (9 mill.).
Average weight 5.50 grains.

Remarks.—This species differs from *A. induta* Nob. in its smaller size, more acuminate form, lighter color, and in the polished exterior of some of its varieties.

Var. b.—More ventricose; aperture nearly semiorbicular. This variety passes into *A. induta.*

Var. c.—More elongate.

Length 0.76 inch (19⅓ mill.); breadth 0.36 inch (9 mill.).

Length of aperture 0.31 inch (8 mill.).

Average weight 3.50 grains.

This variety approaches and passes into *A. terebra* Newc. The two species are, however, distinctly characterized; the latter being more strongly sculptured, having the aperture more elongately oval, and the suture more distinctly margined.

Var. d.—With black or brown spiral bands. This passes into *A. splendida* Newc., but is distinguished by its smaller size and stronger columellar fold. Rather rare.

Var. e.—White. This passes into *A. attenuata* Pfr.

Var. f.—Pale ash-color. Passes into *A. undosa* Nob.

Var. g.—Pale yellowish brown. Passes into *A. crocea* Nob.

Station.—On the Alii and other low trees, in damp elevated regions. E. B.!

Habitat.—Wailuku, Maui. E. Bailey!

obliquely marked with white and yellow; spire conical; suture simple, slightly impressed; whorls 6, somewhat convex, the last slightly flattened in the middle, equal to $\frac{71}{100}$ of the length; columellar fold moderately developed, white; aperture slightly oblique, sinuously oval, snowy white within; peristome not expanded, moderately thickened within; with columellar margin dilated, white, unattached; parietal margin wanting.

Length 0.70 inch (18 mill.); breadth 0.40 inch (10 mill.).

Length of aperture 0.37 inch (9¾ mill.).

Weight 4.00 grains.

Station.— . . . . ? It is undoubtedly an arboreal species.

Habitat.—Waihee, Maui: rare. E. Bailey Jr.!

37. Achatinella ustulata.

Plate VII. Fig. 37.

T. sinistrorsâ, perforatâ, ovato-conicâ, ad basin oblique productâ, solidâ, vix nitidâ, striatâ, et sub lente distincte decussatâ, fuscâ, fasciâ eburneâ ad basin cinctâ; apice subacutâ, albido et fusco tessellatâ; spirâ conicâ, curvilineari; suturâ simplici, leviter impressâ, lineâ angustâ albâ notatâ; anfr. 6½, modice convexis; ultimo magno, $\frac{72}{100}$ longitudinis æquante; plicâ columellari, validâ, albâ, obliquâ; aperturâ perobliquâ, sinuato-ovali; perist. intus incrassato antice reflexo; margine columellari, dilatato, albo, patente; parietali nullo.

Shell sinistral, perforate, ovate-conic, obliquely produced at the base, solid, scarcely shining, striated, and microscopically distinctly decussated, brown, with a whitish band encircling the base; apex subacute, tessellated with white and brown; spire conical, somewhat curvilinear; suture simple, lightly impressed, marked with a narrow white line; whorls 6½, moderately convex; the last large, equal to $\frac{72}{100}$ of the length; columellar fold strong, white, oblique; aperture very oblique, sinuously oval; peristome thickened within, reflected anteriorly; with columellar margin dilated, white, unattached; parietal margin wanting.

Length 1.00 inch (25⅖ mill.); breadth 0.57 inch (14⅖ mill.).
Length of aperture 0.52 inch (13⅕ mill.).
Weight 10.00 grains.

Station.—On the Mamaki (*Urtica grandis?*). S. T. Alex.!
Habitat.—Beautiful Valley, Maui. S. T. Alex.!

Remarks.—This species is more ventricose than *A. perdix* Reeve, and differs in having the whorls more convex, the suture simple, the aperture more oblique, and the sculpturing more distinct.

I have received but two specimens, for which I am indebted to the brothers James and Samuel Alexander.

38. **Achatinella talpina.**

somewhat obtuse, tessellated with white and chestnut; spire regularly conical; suture simple, moderately impressed; whorls nearly 7, convex; the last regularly rounded, equal to $\frac{62}{100}$–$\frac{16}{700}$ of the length; columella strongly plaited above; aperture semiorbicular, brownish-white within; peristome thickened within, scarcely reflected anteriorly; with columellar margin white, and reflected over the deep perforation; parietal margin wanting.

Length 0.85 inch (21⅝ mill.); breadth 0.47 inch (12 mill.).
Length of aperture, 0.36 inch (9 mill.).
Average weight 5.50 grains.

Var. b.—With apex corneous, without tessellations; very rare.

Var. c.—Ventricose; spire short, curvilinear. A small specimen has the following dimensions:—

Length 0.67 inch (17 mill.); breadth 0.42 inch (10⅝ mill.).
Length of aperture 0.30 inch (7⅝ mill.).
Weight 4.50 grains.

Station.—On the Kukui (*Aleurites triloba*). E. Bailey, Jr.!

Habitat.—Wailuku, Maui; rare. E. Bailey, Jr.!

Remarks.—This species passes into *A. Gouldii* Newc. Much handling gradually removes the epidermis from the shell, leaving the surface more or less polished.

39. Achatinella plumbea.

Plate VII. Fig. 39.

T. dextrorsâ, interdum perforatâ, ovato-conicâ, solidâ, nitidâ, irregulariter striatâ, levissime decussatâ, plumbeo-cinereâ, basi fasciâ unâ albâ cinctâ; apice subacutâ; spirâ conicâ; suturâ marginatâ, valide impressâ;

anfr. 6½, perconvexis; plicâ columellari medianâ, albâ, validâ; aperturâ parum obliquâ, sinuato-ovali, intus ceruleo-albidâ; perist. fusco intus incrassato; margine dextro arcuato, vix reflexo; columellari dilatato, albo, interdum subpatente; parietali nullo.

Shell dextral, sometimes perforate, ovate-conic, solid, shining, irregularly striated, very finely decussated, lead-colored, with a white band on the periphery of the last whorl; apex subacute; spire conical; suture marginate, well impressed; whorls 6½, very convex; columellar fold central, white, strong; aperture slightly oblique, sinuately oval, bluish-white within; peristome brown, thickened within; with dextral margin arcuate, scarcely reflected; columellar margin dilated, white, sometimes slightly detached; parietal margin wanting.

Length 0.90 inch (23 mill.); breadth 0.50 inch (13 mill.).
Length of body whorl 0.64 inch (16½ mill.).
Average weight 6.00 grains; least weight 4.30 grains.

Station.—On the trunks of the Aiea and Kukui (*Aleurites triloba*). E. Bailey.!

Habitat.—Kula, E. Maui. E. Bailey.!

suturâ marginatâ, modice impressâ; anfr. fere 7, modice convexis; plicâ columellari medianâ, albâ, validâ; aperturâ parum obliquâ, lunato-rotundatâ; perist. acuto, intus valde incrassato; margine columellari dilatato, adnato, vel interdum subpatente; parietali nullo.

Shell sinistral, scarcely perforate, oblong-ovate, solid, shining, striated, white, with from 1 to 6 black or chestnut bands varying in width; apex subacute; spire convexly conical; suture marginate, moderately impressed; whorls 7, moderately convex; columellar fold central, white, strong; aperture a little oblique, lunately rounded; peristome acute, well thickened within; with columellar margin dilated, adnate, or sometimes slightly detached; parietal margin wanting.

Length 0.86 inch (22 mill.); breadth 0.50 inch (12⅔ mill.).

Length of body whorl 0.64 inch (16¼ mill.).

Length of aperture 0.43 inch (11 mill.); an average sized specimen.

Length of a large specimen 1.00 inch (25⅖ mill.).

Average weight 10.50 grains.

Station.—On the Kukui (*Aleurites triloba*) and Ki (*Cordyline terminalis*). J. T. G.!

Habitat.—Keowaawa, Oahu. J. T. G.!

Var. a.—With one broad band encircling the base.

Var. b.—With two dark bands, one entering the aperture, the other revolving above the suture. This and var. *a* are sometimes found in Kailua, Oahu.

Var. c.—White, with three or four bands at the base.

Var. d.—Without bands, but more or less streaked with fawn brown.

Var. e.—Dark brown, with two white bands, one sutural, the other on the periphery of the body whorl.

Var. f.—Brown, with one or more black bands.

Var. g.—Ash or olive brown, with one or more light bands.

Var. h.—Chestnut or olive brown, with fine, black, spiral lines.

§ β.

Smaller, with outlines of spire less convex; passing into *A. plumata.*

Average weight 5.30 grains.

Habitat.—Vars. *i–k* in Kailua; vars. *l–o* in Olomana.

Var. i.—White, with numerous chestnut bands on the lower part of the whorls.

Var. j.—Light olive brown, with dark bands.

Var. k.—Dark brown, with narrow white bands.

Var. l.—White, with one or two broad black bands at the base.

Var. m.—Elongate, white, with two black bands, one revolving above the suture, the other entering the aperture, and sometimes a third accompanies the sutural margin.

Var. n.—White, with from three to five crowded bands at the base.

41. Achatinella plumata.

Plate VII. Fig. 41.

T. sinistrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatâ, cinereâ, fusco-strigatâ; apice subacutâ; spirâ conicâ, leviter convexâ; suturâ marginatâ, modice impressâ, albâ; anfr. 6½, convexiusculis; plicâ columellari medianâ, albâ, validâ, aperturâ parum obliquâ, truncato-auriformi; perist. subacuto, intus valde incrassato; margine columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, ovate conic, solid, shining, striated, cinereous, with oblique brown streaks; apex subacute; spire conic, with outlines slightly convex; suture marginate, moderately impressed, white; whorls 6½, somewhat convex; columellar fold central, white, strong; aperture somewhat oblique, truncately auriform; peristome subacute, well thickened within; with columellar margin dilated, adnate; parietal margin wanting.

Length 0.90 inch (23 mill.); breadth 0.48 inch (12½ mill.).
Length of body whorl 0.63 inch (16 mill.).
Length of aperture 0.44 inch (11 mill.).
Average weight 8.50 grains.

Station.—On the leaves and branches of trees. J. T. G.!

Habitat.—Niu, Oahu. J. T. G.!

Var. b.—Bluish grey, suture of the same color, lip thinner.

Var. c.—Of ashy chestnut color, with black bands.

Var. d.—Pale, streaked with light fawn brown, sutures white.

Var. e.—Radiated with light brown, sutures the same, lip less thickened, columellar fold tuberculate.

Var. f.—With one or two broad chestnut bands, otherwise like var. *e.*

Var. g.—With three bands, usually black, one of which is sutural.

Var. h.—With a white belt encircling the base between two broad black bands, one of which enters the aperture.

Var. i.—White or yellowish at the base, reddish grey above, with a dark spiral line between.

Var. j.—Fawn-colored, darker towards the apex.

Var. k.—Greyish pink mottled with brown, yellow at the base.

§ β.

Smaller and more elongately ovate.

Length 0.77 inch (19[illegible] mill.). Breadth 0.41 inch (10[illegible] mill.).

Habitat.—Wailupe, Oahu.

Var. l.—Grey radiated with black and brown, with sutures white.

Var. r.—Of greyish fawn color, with sutures white.

Var. s.—Cinnamon or chestnut, variously banded with dark or pale lines; one specimen dextral.

Var. t.—Brownish grey, with one or more black bands at the base.

Var. u.—Cinereous, with numerous pale spiral lines.

Var. v.—Cinereous above, passing into dark brown on the periphery of the body whorl, and greenish yellow at the base.

Var. w.—Of a greyish yellow hue throughout.

Var. x.—Bright fawn color, with a broad white belt on the periphery of the last whorl.

§ *δ.*

Rather thin, with lip acute and scarcely thickened within; pass into *A. Buddii* Newc., found in the same locality.

Average weight 5.30 grains.

Habitat.—Palolo, Oahu. J. T. G.!

Var. y.—Dark brown or cinnamon throughout.

Var. z.—Grey, with fine black lines.

Var. aa.—Yellowish white or grey, with two broad black or chestnut bands, one entering the aperture.

Var. bb.—Brown or slate, with two white bands, one sutural, the other on the periphery of the whorl.

Var. cc.—Greyish pink, with one or two broad white bands at the base.

Var. dd.—Grey above, yellow at the base.

Var. ee.—White, with broad pale bands of greyish pink.

Var. ff.—Fawn, with a narrow black band entering the aperture, and sometimes with a dark sutural line.

Var. gg.—White or pale greyish pink, with one or two narrow slate or chestnut bands.

Var. hh.—White above, brown at the base.

Var. ii.—Bright chestnut, with white sutures, light pink columella.

§ ι.

With spire more convex and colors less streaked; pass into *A phæozona* vars. *i*—*o.*

Habitat.—Kailua, Oahu. J. T. G.!

Var. jj.—Light brownish grey, with several black spiral lines.

Var. kk.—Brown or slate colored, with two white bands, one sutural, the other on the periphery of the last whorl.

Var. ll.—With a broad black zone at the base.

Var. mm.—Olive brown, with two dark bands, a broad one entering the aperture, the other narrower, revolving above the suture.

Var. nn.—Light fawn, with one or two white bands at the base.

Var. oo.—White, with oblique yellowish streaks.

Var. pp.—Fawn-colored, plain or with dark brown bands; sutures white; approaches *A. cervina* Nob.

vexiusculis; plicâ columellari medianâ, roseâ vel albâ; aperturâ obliquâ; truncato-auriformi; perist. acuto, intus incrassato; margine columellari dilatato, adnato; parietali nullo.

Shell sinistral, very rarely dextral, imperforate, ovately or elongately conic, solid, shining, striated, white or variously painted with yellow or green; apex subacute; spire conic; suture marginate, moderately impressed; whorls 6½, somewhat convex; columellar fold central, strong, rose or white; aperture oblique, truncately auriform; peristome acute, thickened within; with columellar margin dilated, adnate; parietal margin wanting.

Length 0.83 inch (21 mill.); breadth 0.45 inch (11⅝ mill.).

Length of body whorl 0.61 inch (15½ mill.).

Length of aperture 0.42 inch (10⅝ mill.); an average specimen.

Greatest length 0.99 inch (25 mill.).

Average weight 8.00 grains.

Station.—On trees. J. T. G.!

Habitat.—Palolo, Waialae, Wailupe, and Niu, Oahu. J. T. G.!

Var. a.—Pure white, except the columella, which is frequently lilac or rose. Pl. VII. Fig. 42*a*.

Var. b.—White, with one black band. Pl. VII. Fig. 42*b*.

Var. c.—White, with two dark bands, one entering the aperture; approaches *A. fulgens* Newc.

Var. d.—White, with yellow or green base.

Var. e.—Yellow, with white bands.

Var. f.—Yellow, fading towards the apex.

Var. g.—Green, fading towards the apex.

Var. h.—Green, passing into grey or brown towards the apex.

Var. i.—Green, with white bands.

Remarks.—Differs from *A. plumata* Nob. in the character and arrangement of its colors, and from *A. fulgens* Newc. in the absence of the white sutural band, and the two broad black central bands which characterize that species.

The specimens found in Niu do not present the green varieties, but incline more to white; and are also thicker and more ovate in form than those found in Palolo. The average weight of full grown specimens from Niu is about 9.00 grains, that of the Palolo specimens is 7.20 grains.

I have six or eight dextral specimens belonging to varieties *d*, *e*, *g*, and *i*.

43. **Achatinella varia.**

Plate VII. Fig. 43.

(A. vulpina, Reeve non Fer. Rv. Conch. Icon. Pl. 4, fig. 29, *a*, *b*, *c*.)

T. sinistrorsâ, imperforatâ, acuminato-oblongâ, solidâ, nitidâ, striatulâ, albidâ, fusco-strigatâ, infra suturam nigro-lineatâ, basi viridi vel fuscescenti; apice acutiusculâ; spirâ elongato-conicâ; suturâ marginatâ, subimpressâ; anfr. 6, plano-convexis; plicâ columellari medianâ, fuscâ vel

Length of a large specimen 1.06 inch (27 mill.); breadth 0.51 inch (13 mill.).

Average weight 6.70 grains.

Station.—On the Kukui (*Aleurites triloba*), Ohia (*Eugenia Malaccæcensis*), and other trees. J. T. G.!

Habitat.—Palolo, Waialae, and Wailupe, Oahu. J. T. G.!

Var. b.—White above, green or yellow at the base.

Var. c.—Green at the base, white above, with one or more green bands.

Var. d.—Green, brown, or yellow at the base, upper whorls radiated with white and brown, and banded with green or yellow.

Var. e.—Radiated with white, and reddish brown.

Var. f.—White except the suture and columella.

Var. g.—Green or yellow; passing into *A. Stewartii* Green.

Var. h.—Green with one narrow, white, spiral band, passing just above the suture.

Var. i.—Yellow with white sutures, and a dark brown band revolving beneath.

Var. j.—Chestnut brown at the base, becoming paler towards the apex, with several obscure, spiral, brown lines.

Remarks.—The metropolis of the species is Palolo valley, where it is very abundant. In Waialae and Wailupe, which lie to the east, it gradually becomes more rare, aud disappears in Niu, which has furnished me but one specimen of var. *f.* In Manoa, on the west, it soon disappears, being found only on the mountain ridge that separates it from Palolo. Dextral specimens are very rare: I have a few from Waialae.

This shell has been described and figured by Reeve as *A. vulpina* Fer., and others have followed him; but a comparison of his figures with Ferussac's leads me to doubt his correctness, and after an acquaintance with the species in their native valleys, I do not hesitate to separate them as distinct.

The shell here figured corresponds more nearly to what I have described as variety *c.*

44. Achatinella versipellis.

Plate VII. Fig. 44*a* and 44*b*.

T. dextrorsâ vel sinistrorsâ, imperforatâ, acuminato-oblongâ, solidâ, nitidâ, striatulâ, cinereâ, magis minusve fusco-strigatâ et undulatâ; a ice obtusulâ; spirâ convexo-conicâ; sutura marginatâ, modice impres â; anfr. 6, convexis; plicâ columellari medianâ, albâ, validâ; apert râ truncato-auriformi, intus albâ; perist. intus incrassato; margine exte no recto, substricto, fusco-limbato; columellari dilatato, adnato; pariet ali nullo.

Shell dextral or sinistral, imperforate, acuminately oblon , solid, shining, striated, of lively ash-color, more or less streak d and waved with brown, with several interrupted brown ban s on the upper parts of the whorls; apex somewhat obtuse; spi e convexly conical; suture margined, moderately impresse ; whorls 6, convex; columellar fold central, white, strong; ape rture truncately auriform, white within, a little oblique, in si nistral specimens very oblique; peristome thickened withi ; with external margin unreflected, compressed, edged wi th

Var. c.—Yellow at the base, with one or more brown bands ove.

Var. d.—Yellow at the base, and white above, without nds.

Var. e.—Nearly pure white.

Var. f.—Ash or yellow grey, without bands.

Remarks.—A rare and beautiful species, found in the most gged but verdant region of Western Kailua. About a third the specimens are sinistral.

45. Achatinella cucumis.

Plate VII. Fig. 45.

sinistrorsâ, imperforatâ, acuminato-oblongâ, solidâ, nitidâ, striatâ, i; apice obtusulâ; spirâ turritâ; suturâ marginatâ, impressâ; 6, convexiusculis; plicâ columellari medianâ, albâ, mediocri; aper- obliquâ, sinuato-ovali, intus albâ; perist. intus incrassato; margine rno recto, arcuato, acuto; columellari dilatato, adnato; parietali o.

Shell sinistral, imperforate, acuminately oblong, solid, shin- g, striated, green; apex rather obtuse; spire turreted; suture rgined, impressed; whorls 6, convex; columellar fold cen- l, white, moderately developed; aperture oblique, sinuately al, white within; peristome thickened within; with external rgin unreflected, arcuate, acute; columellar margin dilated, nate; parietal margin wanting.

Length 0.74 (19 mill.); breadth 0.38 inch (9⅔ mill.).
Length of body whorl 0.50 inch (13 mill.).
Average weight 5.20 grains.

Station.—On trees.

Habitat.—Kalihi, Oahu. J. T. G.!

Var. b.—Of a burnt yellow color.

Var. c.—With one or more obscure brownish spiral lines.

Remarks.—The shell figured is variety *b*, which is the most attractive in coloring, though not the most abundant.

46. Achatinella trilineata.

[Plate VII. Fig. 46.]

T. sinistrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatulâ, albâ, nigro trifasciatâ, basi flavâ vel viridi; apice obtusulâ; spirâ conicâ, leviter convexâ; suturâ anguste marginatâ, modice impressâ; anfr. 6¼, convexiusculis; plicâ columellari medianâ, albâ vel roseâ, validâ; aperturâ truncato-auriformi, intus albâ; perist. intus incrassato; margine externo recto, arcuato, acuto; columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, ovate-conic, solid, shining, finely striated, white above, yellow or green at the base, with three black bands, one sutural, one entering the aperture, and the

Var. b.—With oblique reddish-brown streaks above, the base green or yellow.

Var. c.—Yellowish or green throughout, excepting the bands.

Var. d.—White at the base, and also above.

Var. e.—Covered with oblique reddish-brown streaks.

Var. f.—Apex tipped with black, passing into *A. Buddii* Newc.

Var. g.—Green or yellow, except the black bands, and a narrow line of white.

Var. h.—White, with several fine spiral black lines accompanying the broader bands.

Var. i.—With black bands very broad, occupying half the surface or more.

Var. j.—With two black bands, one sutural, the other passing above the suture.

Var. k.—With two black bands, one sutural, the other entering the aperture; rare.

Var. l.—With several narrow bands on the upper part of the whorls.

Remarks.—Dextral specimens of this species are very rare; I have obtained but two. Varieties *j* and *k* have been found only in Palolo.

As in the preceding species, the specimens found in Niu are of the lighter colored varieties, and more solid than those of the other valleys.

47. **Achatinella analoga.**

Plate VII. Fig. 47.

T. sinistrorsâ, imperforatâ, oblongo-conicâ, solidâ, nitidâ, striatulâ, albidâ vel adustâ vel viridi, nigro trifasciatâ; apice obtusâ; spirâ turritâ; suturâ marginatâ, modice impressâ; anfr. 6, convexiusculis; plicâ columellari medianâ, fuscâ vel albâ, mediocri; aperturâ obliquâ, sinuato-ovali, intus albâ; perist. intus incrassato; margine externo recto, arcuato, acuto; columellari dilatato, adnato, fusco-limbato; parietali nullo.

Shell sinistral, imperforate, oblong conic, solid, shining, finely striated, green, yellow, or white, with three black spiral bands, one sutural, one entering the aperture, the other revolving above the suture; apex obtuse; spire turreted; suture margined, moderately impressed; whorls 6, convex; columellar fold central, brown or white, moderately developed; aperture oblique, sinuately oval, white within; peristome thickened within; with external margin unreflected, arcuate, acute; columellar margin dilated, adnate; edged with brown; parietal margin wanting.

Length 0.72 inch (18⅓ mill.); breadth 0.37 inch (7⅜ mill.).

Length of body whorl 0.48 inch (12 mill.).

Average weight 4.80 grains.

Station.—On various trees and shrubs. J. T. G.!

48. **Achatinella papyracea.**

Plate VII. Fig. 48.

T. sinistrorsâ, imperforatâ, ovato-conicâ, tenui, politâ, leve striatâ, pallide griseâ vel plumbeo-cinereâ, lineis fuscis obscuris ornatâ; apice subacutâ; spirâ convexo-conicâ; suturâ marginatâ, impressâ; anfr. 5½, modice convexis; plicâ columellari medianâ, albidâ, levi, subtortâ; aperturâ obliquâ, sinuato-ovali, intus albâ vel cinereâ; perist. vix incrassato; margine externo recto, arcuato, acuto; columellari angusto, adnato; parietali nullo.

Shell sinistral, imperforate, ovate-conic, thin, polished, finely striated, light grey, or of leaden ash color, with obscure, brown spiral, lines; apex subacute; spire convexly conical; suture marginate, impressed; whorls 5½, moderately convex; columellar fold central, usually white, slightly developed, and not strongly twisted; aperture oblique, sinuately oval, white or grey within; peristome scarcely thickened, with external margin unreflected, arcuate, acute; columellar margin narrow, adnate; parietal margin wanting.

Length 0.65 inch (16½ mill.); breadth 0.38 inch (9⅔ mill.).

Length of body whorl 0.48 inch (12 mill.).

Of a large specimen, length 0.74 inch (19 mill.); breadth 0.41 inch (10⅔ mill.); length of body whorl 0.53 inch (13½ mill.).

Average weight 2.50 grains.

Station.—On the Hala (*Pandanus odoratissimus*) and other trees. J. T. G.!

Habitat.—Kalaikoa, Ahonui, and Wahiawa, Oahu. J. T. G.!

Var. b.—Without the brown lines.

Remarks.—A thin papyraceous shell, a few specimens of which I had the good fortune to obtain from a native girl of the mountain, who regretted the time spent in gathering them, as several had been crushed among her heavier shells.

49. **Achatinella juncea.**

Plate VII. Fig. 49.

T. sinistrorsâ, imperforatâ, elongatâ, acuminato-ovatâ, tenui, nitidulâ, striatulâ, albâ; apice acutiusculâ; spirâ convexo-turritâ; suturâ filo-marginatâ, vallde impressâ; anfr. 6, convexis; plicâ columellari superâ, albâ, levi, tortâ; aperturâ obliquâ, ovali, intus albâ; perist. modice incrassato; margine externo antice leviter expanso, arcuato, acuto; columellari angusto, adnato; parietali tenuissimo.

Shell sinistral, imperforate, elongately and acuminately ovate, thin, shining, finely striated, snow white; apex somewhat acute; spire convexly turreted; suture margined, well impressed; whorls 6, convex; columella white, with a light twisted fold near the body whorl; aperture oblique, oval, white within; peristome moderately thickened; with external margin slightly expanded anteriorly, arcuate, acute; columellar margin narrow, adnate; parietal margin very thin.

Length 0.65 inch (16½ mill.); breadth 0.30 inch (7⅝ mill.).

50. **Achatinella delta.**

Plate VIII. Fig. 50.

sinistrorsâ, imperforatâ, conicâ, basi oblique truncatâ, solidâ, nitidâ,
â, lutescente, fasciis 2 vel 3 cinereo-fuscis cinctâ; apice obtusulâ,
; spirâ conicâ; suturâ marginatâ, leviter impressâ; anfr. 5½ sub-
exis; plicâ columellari medianâ, albâ, validâ; aperturâ truncato-
ormi, intus albâ; perist. intus subincrassato; margine externo recto,
ato, acuto; columellari dilatato, adnato, albo; parietali nullo.

hell sinistral, imperforate, conic, obliquely truncated at the
, solid, shining, striated, yellow at the base, paler above,
2 or 3 ash-brown bands; apex rather obtuse, white; spire
c; suture marginate, lightly impressed; whorls 5½, slightly
vex; columellar fold central, white, strong; aperture trun-
ly auriform, white within; peristome thickened within;
external margin unreflected, arcuate, acute; columellar
gin dilated, adnate, white; parietal margin wanting.
ength 0.63 inch (16 millim.); breadth 0.42 inch (10⅔ millim.).
ength of body whorl 0.46 inch (11⅔ millim.).
verage weight 4.70 grains.

tation.—On trees and shrubs. J. T. G.!
abitat.—Kalaikoa, Ahonui, Wahiawa, and Helemanu,
u. J. T. G.!

ar. b.—Without bands.
ar. c.—With one black spiral line.
ar. d.—With two broad black bands.

emarks.—In Wahiawa, which is the metropolis of the
cies, var. *a* is most abundant; var. *b* is more widely diffused,
ng occasionally found in each of the above-mentioned
alities; vars. *c* and *d* are very rare; the former approaches
contracta Nob., and the latter passes into an unusual
iety of *A. Emersonii* Newc.

The most nearly allied species is *A. curta* Newc., which is readily distinguished by its peculiar marking and smaller size.

51. **Achatinella glauca.**

Plate VIII. Fig. 51.

T. sinistrorsâ, raro dextrorsâ, imperforatâ, acuminato-ovatâ, solidâ, nitidâ, striatâ, flavescente-plumbeâ, nigro-bifasciatâ; apice acutiusculâ, albidâ; spirâ subconvexo-conicâ; suturâ marginatâ, modice impressâ; anfr. 6, convexis; plicâ columellari medianâ, albâ vel roseo-albidâ, mediocri; aperturâ sinuato-ovali, intus albidâ; perist. intus incrassato; margine externo recto, arcuato, acuto, fusco-limbato; columellari dilatato, adnato; parietali nullo.

Shell sinistral, rarely dextral, imperforate, acuminately ovate, solid, shining, striated, fawn or lead-colored, with two black bands, one entering the aperture; apex somewhat acute, white; spire conic, with slightly convex outlines; suture marginate, moderately impressed; whorls 6, convex; columellar fold central, white or pale pink, moderately developed; aperture

Remarks.—This species bears the same relation to *A. livida* ains., that *A. recta* Newc. bears to *A. curta* Newc.

52. **Achatinella herbacea.**

Plate VIII. Fig. 52.

'. sinistrorsâ, interdum dextrorsâ, imperforatâ, ovato-conicâ, solidâ, lâ, striatâ, viridi; apice obtusulâ, albâ; spirâ conicâ; suturâ mar- .tâ, modice impressâ; anfr. 6, convexis; plicâ columellari medianâ, , validâ; aperturâ truncato-auriformi, intus albâ; perist. intus sub- assato; margine externo recto, arcuato, acuto; columellari dilatato, ato, albo; parietali tenuissimo.

hell sinistral, sometimes dextral, imperforate, ovate-conic, d, shining, striated, of a dull green color; apex rather use, white; spire conic, suture marginate, moderately im- ssed; whorls 6, convex; columellar fold central, white, ng; aperture truncately auriform, white within; peristome htly thickened within; with external margin unreflected, uate, acute; columellar margin dilated, adnate; parietal rgin very thin.

ength 0.71 inch (18 millim.); breadth 0.41 inch (10⅖ millim.).

ength of body whorl 0.50 inch (13 millim.).

verage weight 4.40 grains.

tation.—On the leaves of the Pua, Ahakea, and Ohawai *belia Grimesiana*).

Habitat.—In the forests between the streams of Waimea and wailoa, Oahu. J. T. G.!

Var. b.—With a black sutural band; columellar fold usu- y white, sometimes lilac.

Var. c.—Yellow, with smoother surface, approaching *A. ta* Newc.

Remarks.—Dr. Newcomb has placed this with *A. curta* wc., but I consider it quite distinct.

About a fifth of my specimens are dextral.

53. **Achatinella cæsia.**

Plate VIII. Fig. 53.

T. sinistrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatâ, cinereâ; apice acutiusculâ; spirâ convexo-conicâ; suturâ marginatâ, modice impressâ; anfr. 6½, convexis; plicâ columellari medianâ, albâ, mediocri; aperturâ sinuato-ovali, intus albidâ; perist. intus vix incrassato; margine externo recto, arcuato, acuto, fusco-limbato; columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, ovate-conic, solid, shining, striated, so streaked with white and fawn brown as to have a grey appearance; apex somewhat acute; spire convexly conic; suture marginate, moderately impressed; whorls 6½, convex; columellar fold central, white, moderately developed; aperture sinuately oval, white within; peristome slightly thickened within; with external margin unreflected, arcuate, acute, edged with brown; columellar margin dilated, adnate; parietal margin wanting.

Length 0.72 inch (18⅓ millim.); breadth 0.42 inch (10⅔

apice acutiusculâ; spirâ convexo-conicâ; suturâ margi-
modice impressâ; anfr. 6½, convexis; plicâ columellari
bâ, mediocri; aperturâ truncato-ovali, intus albidâ; perist.
sato; margine externo recto, arcuato; columellari dilatato,
rietali nullo.

nistral, imperforate, ovate-conic, solid, shining, stri-
rn banded with white; apex somewhat acute; spire
conic; suture marginate, white, moderately im-
whorls 6½, convex; columellar fold central, white,
y developed; aperture truncately oval, white within;
thickened within; with external margin unreflected,
columellar margin dilated, adnate; parietal margin

0.79 inch (20 millim.); breadth 0.43 inch (11 millim.).
of body whorl 0.55 inch (14 millim.).
e weight 4.75 grains.

—On trees. J. T. G.!
.—Waimea, Oahu. J. T. G.!
ts.—My specimens of this species are more or less
and faded. Continued search was made for living
, but without success.

55. Achatinella formosa.

Plate VIII. Fig. 55.

rorsâ, imperforatâ, acuminato-ovatâ, solidâ, nitidâ, striatâ,
bifasciatâ; apice acutiusculâ; spirâ convexo-conicâ; suturâ
bene impressâ; anfr. 6½, convexis; plicâ columellari medianâ,
; aperturâ truncato-auriformi, intus albâ; perist. intus in-
nargine externo recto, arcuato, acuto; columellari dilatato,
rietali nullo.

nistral, imperforate, acuminately ovate, solid, shining,
white, with two black bands, one entering the aper-
etimes with the upper part of the whorl of a pale

slate color; apex somewhat acute; spire convexly conic suture marginate, well impressed; whorls 6½, convex; columellar fold central, white, strong; aperture truncately auriform white within; peristome thickened within; with externa margin unreflected, arcuate, acute; with columellar margi dilated, adnate; parietal margin wanting.

Length 0.80 inch (20⅓ millim.); breadth 0.42 inch (10⅔ millim.).

Length of body whorl 0.55 inch (14 millim.).

Average weight 6.00 grains.

Station.—On the Ki (*Cordyline terminalis*) and other leaves. J. T. G.!

Habitat.—Waimea, Oahu. J. T. G.!

Var. b.—With the two bands uniting in one broad black belt.

Var. c.—With numerous black spiral lines.

Remarks.—A rare species, and of great interest on account of its affinities, which connect it with species so different from each other. *A. glauca*, *delta*, *phæozona*, and *zonata* Nob. are certainly not very similar; but this species seems to connect

ately impressed; dark brown; whorls 6, convex; columellar old central, white or rose, moderately developed; aperture runcately ellipsoidal, white within; peristome slightly thickened within; with external margin unreflected, arcuate, acute; columellar margin dilated, adnate; parietal margin wanting.

Length 0.70 inch (18 mill.); breadth 0.37 inch (9⅖ millim.).

Length of body whorl 0.45 inch (11⅖ mill.).

Average weight 4.00 grains.

Station.—On the leaves of the Pua, Ahakea, and other trees. J. T. G.!

Habitat.—Waimea, Pupukea, Waialei, and Kahuku, Oahu. J. T. G.! Kaawa, Oahu. J. S. Emerson!

Remarks.—This and *A. zonata* Nob., which inhabit the same valleys, correspond to *A. curta* and *A. recta* Newc., which are similarly associated in the valleys of Waialua, an adjoining district of the same island.

57. Achatinella albescens.

Plate VIII. Fig. 57.

T. sinistrorsâ, interdum dextrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatâ, albâ, interdum lutescente; apice acutiusculâ; spirâ convexo-conicâ; suturâ marginatâ, valide impressâ; anfr. 6, infra suturam tumidiusculis, in medio subplanatis; plicâ columellari medianâ, albâ, validâ; aperturâ truncato-auriformi, intus albâ; perist. intus incrassato; margine externo recto, leviter arcuato; columellari dilatato, adnato; parietali nullo.

Shell sinistral, sometimes dextral, imperforate, ovate-conic, solid, shining, striated, white or sometimes yellowish; apex somewhat acute; spire convexly conical; suture marginate, well impressed; whorls 6, somewhat swollen beneath the suture, and slightly flattened in the middle; columellar fold central, white, strong; aperture truncately auriform, white within; peristome thickened within; with external margin unreflected, slightly arcuate; columellar margin dilated, adnate; parietal margin wanting.

Length 0.70 inch (18 millim.); breadth 0.42 inch (10⅜ millim.).
Length of body whorl 0.51 inch (13 millim.),
Average weight 4.60 grains.

Station.—On the leaves of the Pua, Ahakea, and Lama. J. T. G.!

Habitat.—Waimea, Pupukea, Waialei, Kahuku, and Hauula, Oahu. J. T. G.! Kaawa, Oahu. J. S. Emerson!

Remarks.—Nearly a third of the specimens from Waimea and Pupukea are dextral, but in Waialei, the metropolis of the species, they are always sinistral.

58. Achatinella zonata.

Plate VIII. Fig. 58.

T. sinistrorsâ, interdum dextrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatâ, albâ vel lutescente, nigro-trifasciatâ; apice acutiusculâ; spirâ convexiusculo-conicâ; suturâ marginatâ, modice impressâ; anfr.

Length 0.65 inch (16½ millim.); breadth 0.40 inch (10 millim.).
Length of body whorl 0.49 inch (12⅖ millim.).
Average weight 4.60 grains.

Station.—On the leaves of trees. J. T. G.!

Habitat.—Waimea, Pupukea, Waialei, Kahuku, and Hauula, Oahu. J. T. G.! Kaawa, Oahu. J. S. Emerson!

Remarks.—The dextral specimens are for the most part found in Waimea and Pupukea.

This and the two preceding species vary much in form and size.

59. Achatinella contracta.

Plate VIII. Fig. 59.

T. sinistrorsâ, imperforatâ, late conicâ, solidâ, nitidâ, striatâ, cinereâ vel flavâ, nigro-bifasciatâ; apice acutiusculâ, albâ; spirâ conicâ; suturâ marginatâ, modice impressâ; anfr. 5½, convexiusculis; ultimo magno; plicâ columellari medianâ, albâ, validâ; aperturâ truncato-auriformi, intus albidâ; perist. intus incrassato; margine externo recto, arcuato, subacuto; columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, broadly conic, solid, shining, striated, ash or fawn colored, with two black bands, one sutural, the other revolving just above the suture on the spire, and encircling the base near the periphery of the body whorl; apex somewhat acute, white with brown suture; spire regularly conic; suture marginate, moderately impressed; whorls 5½, slightly convex; the last large; columellar fold central, white, strong; aperture truncately auriform, white within; peristome thickened within; with external margin unreflected, arcuate, subacute; columellar margin dilated, adnate; parietal margin wanting.

Length 0.53 inch (13½ millim.); breadth 0.36 inch (9 millim.).
Length of body whorl 0.39 inch (10 millim.).
Average weight 4.00 grains.

Station.—On trees.

Habitat.—Kaawa, Oahu. J. S. Emerson! Hauula, Oahu. J. T. G.!

Remarks.—The sutural band is sometimes wanting, and some specimens have another band entering the aperture. I have but one specimen from Hauula, which is of the last mentioned variety, and rather larger than those from Kaawa.

It is allied to *A. zonata* Nob. and *A. undulata* Newc.

60. **Achatinella cognata.**

Plate VIII. Fig. 60.

T. sinistrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatâ, pallidè roseo-cervinâ, fasciâ 1 fuscâ suturali ornatâ; apice subacutâ; spirâ convexo-conicâ; suturâ marginatâ, fuscâ, subimpressâ; anfr. 6, subconvexis; plicâ columellari medianâ, roseâ, validâ; aperturâ truncato auriformi, intus roseo-albidâ; perist. intus subincrassato; margine externo recto, arcuato, acuto; columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, ovate conic, solid, shining, striated, of pale rosy fawn color, with a brown sutural band; apex

61. Achatinella scitula.

Plate VIII. Fig. 61.

sinistrorsâ, imperforatâ, turrito-ovatâ, solidâ, nitidâ, striatâ, fusco pallido-cervino strigatâ; apice subacutâ; spirâ convexo-elongatâ; râ marginatâ, modice impressâ; anfr. 6½, convexis; plicâ columellari râ, albâ, mediocri; aperturâ sinuato-ellipsoideâ, intus albâ; perist. s valide incrassato; margine externo recto, antice arcuato, in medio ter substricto; columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, elongately ovate, solid, shining, ated, streaked with brown and pale fawn; apex subacute; re convexly elongate; suture marginate, moderately im- ssed; whorls 6½, convex; columella with a moderately de- oped white fold near the body whorl; aperture sinuately psoidal, white within; peristome well thickened within; with ernal margin unreflected, slightly compressed in the middle, h the anterior edge arcuate; columellar margin dilated, ate; parietal margin wanting.

Length 0.82 inch (21 millim.); breadth 0.42 inch (10⅔ millim.).
Length of body whorl 0.53 inch (13½ millim.).
Average weight 4.80 grains.

Station.—On trees. J. T. G. !
Habitat.—Hakipu, Oahu. J. T. G. !

Remarks.—There is a green variety which passes into var. *c* he last described species. But in that species the suture and umella are dark, while in this they are light-colored.

62. Achatinella cervina.

Plate VIII. Fig. 62.

. sinistrorsâ, vix perforatâ, ovato-conicâ, tenuiusculâ, nitidâ, striatâ, inâ, lineis spiralibus fuscis obsolete ornatâ; apice subacutâ, spirâ

convexo-conicâ; suturâ obsolete marginatâ, modice impressâ; anfr. 6, convexis; plicâ columellari medianâ, albâ, sublamelliformi, bene tortâ; aperturâ sinuato-ovali, intus albâ; perist. intus subincrassato; margine externo recto, arcuato; columellari dilatato, adnato; parietali nullo.

Shell sinistral, scarcely perforate, ovate conic, rather thin, shining, striated, fawn colored, with obscure brown spiral lines; apex subacute; spire convexly conic; suture obsoletely margined, moderately impressed; whorls 6, convex; columellar fold central, white, sublamelliform, well twisted; aperture sinuately oval, white within; peristome slightly thickened within; with external margin unreflected, arcuate; columellar margin dilated, adnate; parietal margin wanting.

Length 0.78 inch (20 millim.); breadth 0.45 inch (11⅔ millim.).

Length of body whorl 0.55 inch (14 millim.).

Average weight 3.80 grains.

Station.— . . . . ? It is probably arboreal.

Habitat.—Kahana, Oahu: very rare. J. T. G.

Remarks.—I have ventured to separate this from *A. ovata* with which Dr. Newcomb placed it, who supposed that its ing of the varieties of different species into one another, n many instances been noted; but the affinities are more licated than would appear from the descriptions. From cause, together with the perplexity arising from dextral sinistral varieties, from lack of specimens representing y of the forms of the genus, and from inability to ascertain geographical relations of the species, unavoidable errors d their way into Reeve's Monograph of the genus, from h confusion has arisen in the nomenclature of the species iis group especially. Additional error has since been duced, by the description, under new names, of certain imens of well known shells, which the demand for new and tiful species had subjected to artificial treatment. So sucul was the deception that some are still received as uine, which I am persuaded belong to this class.

. *vulpina* Fer. was described as a sinistral species, and acingly the name was applied only to sinistral specimens. dextral varieties of this species were described by Reeve er the names of *A. producta* and *A. bilineata*, while the e *vulpina* was transferred by him to another species, which iave now described as *A. varia*, to which was added, as a ety, the distinct species *A. livida* Swains., and also by ffer, *A. Stewarti* Green. Other dextral specimens, which been described by Dr. Newcomb under the names *A. ulata* and *A. hybrida*, differ from the dextral type chiefly ie arrangements of the color, which I think are not specific acters, if indeed they are natural. *A. venulata*, var. *a*, I to be the green variety of *A. Stewarti*.

.. *Johnsonii* and *A. aplustre* Newc. are fine specimens of *Byronii*, the one entirely, and the other partially deprived ts epidermis.

he name *A. Byronii* has given place to *A. pulcherrima*, ch belongs to a species similar in outline, but of very dist affinities.

L. *livida* Swains. is much smaller than *A. vulpina* Fer. and quite distinct. Its allied species are *A. curta, recta, undulata*, and *Emersonii* Newc., and *A. glauca* Nob. It has the colored suture of the first, and the greenish lead-color of the last two.

If, then, I am correct, the names of these species are as follows:

Achatinella vulpina Fer.
——— *producta* Reeve.
——— *bilineata* Reeve.
——— *venulata* Newc. }
——— *hybrida* Newc. } *A. venulata Pfr.*

Achatinella varia Gulick.
——— *vulpina* Rv. et Pfr. (*in parte*), non Fer.

Achatinella Stewarti Green.
——— *vulpina* Pfr. (*in parte*), non Fer.
——— *venulata var. a* Newc.

Achatinella livida Swains.
——— *vulpina* Pfr. et Rv. (*in parte*), non Fer.

Achatinella Byronii Gray.
——— *pulcherrima* Pfr. (*in parte*) et Rv., non Swains.

ding many new species. I have since explored all that t of the island, and none of these species were found, nor whose affinities indicated an approach to the home of such ns. But as I departed from the valleys near Honolulu into au, I found the varieties and species differing more and re from that type. The unavoidable inference is, that inad of being from Kolau, they are from the valleys near nolulu, where *A. vulpina*, *Byronii*, and *Stewarti* abound. strength of this inference will be best appreciated by those o are acquainted with the limited distribution of the groups, well as of the species of this genus, and the relation between ir geographical distribution and the graduation of their es.

Moreover the peculiar markings of these specimens do not end within the aperture, where they would also appear if ural. The pink band of *A. aplustre* is cut off abruptly at aperture, in entire variance from the laws of arrangement olor which prevail in this genus.

Dr. Newcomb has followed in restoring *A. livida*, making it lude, besides Swainson's type, *A. Emersonii* Newc., *A. uca* Nob., and *A. Reevei* Ad. If *A. Emersonii* and *glauca* to be merged in *A. livida*, would not a consistent system classification require that *A. recta* and *undulata* should wise be placed under *A. curta*, since the relation is similar? have never seen *A. Reevei* Ad.; but if I can judge of its nities from Reeve's figure, it is different from the others, l will probably be found on the island of Molokai.

63. Achatinella obliqua.

Plate VIII. Fig. 63.

sinistrorsâ, subperforatâ, ovatâ, basi oblique truncatâ, solidâ, lâ, striatâ, cinereo-plumbeâ, infra suturam late albo-cinctâ; apice isâ; spirâ convexo-conicâ; suturâ submarginatâ, leviter impressâ; 6. subconvexis; ultimo magno; plicâ columellari medianâ, albâ, validâ; aperturâ obliquâ, truncato-auriformi; perist. albo, intus incrassato; margine externo subreflexo, arcuato; columellari elevato, sinuato obtuso, subpatente; parietali tenui.

Shell sinistral, subperforate, ovate, obliquely truncated at the base, solid, shining, striated, of ashen lead-color, with a broad white band beneath the suture; apex obtuse, of a yellowish white color; spire convexly conical; whorls 6, subconvex; the last large; columellar fold central, white, strong; aperture oblique, truncately auriform, nearly white within; peristome white, thickened within; with external margin somewhat reflected, arcuate; columellar margin forming an obtuse, sinuous ridge with a small umbilical cleft behind it; parietal margin thin.

Length 0.90 inch (23 millim.); breadth 0.50 inch (13 millim.).
Length of body whorl 0.65 inch (16½ millim.)
Average weight 9.00 grains.

Station.—On trees. J. T. G.!
Habitat.—Kahana, Oahu. J. T. G.!

Remarks.—Is allied to *A. ovata* Newc., with which it is associated geographically, but differs from it in its broader form and white lip. The dark coloring of the body whorl abruptly terminates near the external margin of the peristome, leaving a white border about an eighth of an inch in width around the

usco obscure bifasciatâ, infra suturam albâ; apice obtusulâ, ; spirâ convexo-conicâ; suturâ marginatâ, modice impressâ; , convexis; plicâ columellari medianâ, albâ, validâ; aperturâ -auriformi, intus albidâ; perist. intus incrassato; margine antice subreflexo, arcuato, albo vel fusco; columellari reflexo, , albo; parietali tenuissimo.

l dextral, perforate, ovate, solid, shining, striated, ash, or own, with two obscure brown bands, white beneath the ; apex rather obtuse, chestnut-brown; spire convexly l; suture marginate, moderately impressed; whorls 6½, ; columellar fold central, white, strong; aperture trun- auriform, white within; peristome thickened within; xternal margin slightly reflected anteriorly, arcuate, or brown; columellar margin reflected, detached, white; d margin very thin.

gth 0.80 inch (20⅓ millim.); breadth 0.44 inch (11¼ millim.).
gth of body whorl 0.55 inch (14 millim.).
rage weight 7.00 grains.

ion.—On trees. J. T. G.!
itat.—Kahana, Oahu. J. T. G.!

arks.—Sinistral specimens are sometimes found which ole *A. obliqua*, but are readily distinguished by the coloring around, and upon the lip. I have from a a few specimens which seem to belong to this species. of them are nearly white.

65. **Achatinella spadicea.**

Plate VIII. Fig. 65.

inistrorsâ, imperforatâ, conico-ovatâ, solidâ, nitidâ, striatâ, â, fasciâ 1 spirali albâ suturali cinctâ; apice obtusulâ; spirâ -conicâ; suturâ marginatâ, modice impressâ; anfr. 6, convexis; lumellari medianâ, albidâ, validâ; aperturâ truncato-auriformi, ulatâ, intus albâ; perist. intus incrassato, nigro-fusco; margine externo antice vix reflexo, substricto; columellari valido, calloso, adnato; parietali tenuissimo.

Shell sinistral, imperforate, conic-ovate, solid, shining, striated, chestnut-brown, with a white sutural band; apex rather obtuse; spire convexly conic; suture marginate, moderately impressed; whorls 6, convex; columellar fold central, white, strong; aperture truncately auriform, subangulated, white within; peristome thickened within, very dark brown; with external margin scarcely reflected anteriorly, compressed; columellar margin strong, callous, adnate; parietal margin very thin.

Length 0.73 inch (18½ millim.); breadth 0.43 inch (11 millim.).
Length of body whorl 0.50 inch (13 millim.).
Average weight 6.40 grains.

Station.—On trees. J. T. G.!
Habitat.—Kahana, Oahu. J. T. G.!

Remarks.—The white sutural band is continued up to the very tip of the nuclear whorls, in a manner quite different from what is seen in the bands of *A. obliqua* and other species rugose; columellar fold central, white, strong; aperture truncately auriform, white within; peristome thickened within, white, sometimes margined with brown; with external margin scarcely reflected anteriorly; columellar margin dilated, adnate; parietal margin wanting.

Length 0.72 inch (18¼ millim.); breadth 0.40 inch (10 millim.).

Length of body whorl 0.50 inch (13 millim.).

Average weight 5.30 grains.

Station.—On trees. J. T. G.!

Habitat.—Hakipu, Oahu. J. T. G.!

Remarks.—The color is often nearly black, and sometimes reddish yellow.

It has been placed by Dr. Newcomb with his *A. decipiens*, but is more nearly allied to *A. rugosa* Newc. From the latter it differs in its usually white lip, and the more convex outlines of its spire. The color also fades gradually towards the apex, instead of terminating abruptly in white, as in *A. rugosa*. Sinistral specimens have been found.

67. **Achatinella rotunda.**

Plate VIII. Fig. 67.

T. sinistrorsâ, imperforatâ, ovatâ, basi oblique truncatâ, solidâ, nitidâ, striatâ, nigro-castaneâ, infra suturam fulvo vel albo late cinctâ; apice obtusâ, castaneâ; spirâ convexo-conicâ; suturâ marginatâ, nigrâ, bene impressâ; anfr. 6, convexis; ultimo magno, rotundato; plicâ columellari medianâ, albidâ, validâ; aperturâ obliquâ, truncato-auriformi; perist. nigro, intus subincrassato; margine externo antice subreflexo, arcuato; columellari dilatato, adnato; parietali nullo.

Shell sinistral, imperforate, ovate, obliquely truncated at the base, solid, shining, striated, of black chestnut color, with a broad white or yellowish chestnut band beneath the suture; apex obtuse, chestnut; spire convexly conic; suture margined, black, well impressed; whorls 6, convex; the last large, rounded; columellar fold central, white, strong; aperture oblique, truncately auriform; peristome black, slightly thickened within; with external margin slightly reflected anteriorly, arcuate; columellar margin dilated, adnate; parietal margin wanting.

Length 0.83 (21 millim.); breadth 0.50 inch (13 millim.).
Length of body whorl 0.61 inch (15½ millim.).
Average weight 8.80 grains.

Station.—On trees. J. T. G.!
Habitat.—Kaawa and Kahana, Oahu. J. T. G.!

Remarks.—There is a variety with two black bands which resembles certain forms of *A. ovata* Newc., but is distinguished by its black suture and its thinner and more regularly arcuate lip. Its bands are also deep black, while those of *A. ovata* are brown as in *A. bulimoides* Swains.

68. **Achatinella torrida.**

Plate VIII. Fig. 68.

T. sinistrorsâ, imperforatâ, ovato-conicâ, solidâ, nitidâ, striatâ, subru-

Length of body whorl 0.48 inch (12 millim.).
Average weight 4.50 grains.

Station.—On trees. J. T. G.!

Habitat.—Kahana, Kaawa, and Waikane, Oahu. J. T. G.! Waiolu, Oahu. J. S. Emerson.

Var. b.—With black spiral lines.

Remarks.—I am in doubt concerning the limits of variation of this species. *Var. b.* may be distinct.

69. Achatinella nympha.

Plate VIII. Fig. 69.

T. dextrorsâ, imperforatâ, oblongo-ovatâ, solidâ, nitidâ, levissime striatâ, flavâ vel castaneâ, interdum fusco-lineatâ; apice subacutâ; spirâ convexo-conicâ; suturâ anguste marginatâ, modice impressâ; anfr. 6, convexiusculis; plicâ columellari medianâ, albâ, validâ; aperturâ truncato-auriformi, intus albâ; perist. albo-labiato; margine externo vix reflexo, arcuato; columellari dilatato, adnato; parietali nullo.

Shell dextral, imperforate, oblong-ovate, solid, shining, very lightly striated, yellow or chestnut, sometimes lined with brown; apex subacute; spire convexly conic; suture narrowly margined, moderately impressed; whorls 6, somewhat convex; columellar fold central, white, strong; aperture truncately auriform, white within; peristome white, strongly labiate; with external margin scarcely reflected, arcuate; columellar margin dilated, adnate; parietal margin wanting.

Length 0.73 inch (18½ millim.); breadth 0.40 inch (10 millim.).
Length of body whorl 0.50 inch (13 millim.).
Average weight 6.30 grains.

Station.—On the leaves of the Naupaka (*Scævola Chamissoniana*) and other trees. J. T. G.!

Habitat.—Ahonui, Wahiawa, Helemanu, Kawailoa, and Waimea, Oahu. J. T. G.!

Remarks.—Helemanu is the metropolis of the species, but it is sometimes found in the other valleys above mentioned.

It has been confounded with *A. recta* Newc., which belongs to a very distinct group.

70. Achatinella limbata.

Plate VIII. Figs. 70 a and 70 b.

T. dextrorsâ, imperforatâ, conicâ, solidâ, nitidâ, striatâ, interdum rugosâ, viridi vel flavâ; apice obtusâ, roseâ; spirâ conicâ; suturâ marginatâ, nigrâ, modice impressâ; anfr. 6, convexis; ultimo subangulato; plicâ columellari medianâ, albâ, validâ; aperturâ subtetragono-auriformi, intus albâ; perist. nigro, intus subincrassato; margine externo antice subreflexo, substricto; columellari dilatato, adnato; parietali nullo.

Shell dextral, imperforate, conic, solid, shining, striate, sometimes rugose, green or yellow; apex rose, frequently faded in mature specimens; spire conic; suture margined, black, mode-

more rugose, with rose-colored apex and subangulated body whorl.

71. **Achatinella bulbosa.**

Plate VIII. Fig. 71.

T. sinistrâ, imperforatâ, interdum subperforatâ, subpyriformi, solidiusculâ, impolitâ, striatâ, flavido-albâ, strigis confluentibus epidermidis nigræ irregulariter pictâ; apice acutâ; spirâ concavo-conicâ; suturâ simplice, valide impressâ; anfr. 7, convexis; ultimo magno; plicâ columellari medianâ, fuscâ, lamelliformi, fere transversâ; aperturâ obliquâ, sinuato-lunatâ, intus pallide roseâ; perist. tenui, acuto; margine externo recto, arcuato; columellari dilatato, adnato vel interdum subpatente; parietali nullo.

Shell sinistral, imperforate or sometimes slightly perforate, subpyriform, rather solid, unpolished, striate, yellowish white, covered with irregular streaks of black epidermis, which blend in broad patches towards the base; apex acute; spire concavely conic; suture simple, well impressed; whorls 7, convex; the last large; columellar fold central, brown, lamelliform, nearly transverse; aperture oblique, sinuately lunate, pale pink within, shading into brown near the columella; peristome thin, acute; with external margin unreflected, arcuate; columellar margin dilated, adnate, or sometimes slightly detached; parietal margin wanting.

Length 0.85 inch (21⅗ millim.); breadth 0.52 inch (13⅕ millim.).
Length of body whorl 0.60 inch (15⅕ millim.).
Average weight 7.00 grains.

Station.—On trees and vines. J. M. Alexander. !

Habitat.—Honuaula, E. Maui. E. Bailey. ! Kula, E. Maui. J. M. Alexander. !

Remarks.—I have a dextral specimen, which is the only one I have seen belonging to any species of this group.

72. **Achatinella mahogani.**

Plate VIII. Fig. 72.

T. dextrorsâ, imperforatâ, turritâ, solidâ, nitidâ, striatâ, fulvo-castaneâ; apice obtusâ, roseâ; spirâ concavo-turritâ; suturâ leviter marginatâ, modice impressâ; anfr. 6, convexis; ultimo inflato, basi rotundato ac nigro-castaneo; plicâ columellari medianâ, albâ, validâ; aperturâ truncato-auriformi, intus albâ; perist. fusco-limbato, intus incrassato; margine externo antice vix reflexo, arcuato; columellari dilatato, adnato; parietali nullo.

Shell dextral, imperforate, turreted, solid, shining, striate, reddish chestnut; apex obtuse, rose; spire concavely turreted; suture lightly margined, moderately impressed; whorls 6, convex; the last inflated, with the base black-chestnut and regularly rounded; columellar fold central, white, strong; aperture truncately auriform, white within; peristome margined with brown, thickened within; with external margin scarcely reflected anteriorly, arcuate; columellar margin dilated, adnate; parietal margin wanting.

Length 0.81 inch (20⅔ millim.); breadth 0.43 inch (11 millim.)—

**ellari medianâ, validâ, roseâ, interdum albâ; aperturâ obliquâ, truncato-
riformi, intus albâ; perist. acuto, intus incrassato; margine externo
cto, arcuato; columellari dilatato, adnato; parietali nullo.**

Shell sinistral, imperforate, ovate-conic, solid, shining, striate,
een or yellowish; apex subacute, yellowish white; spire con-
xly conic; suture margined, chestnut, moderately impressed;
horls 6, convex; columellar fold central, strong, rose or some-
mes white; aperture oblique, truncately auriform, white
ithin; peristome acute, thickened within; with dextral mar-
n unreflected, arcuate; columellar margin dilated, adnate;
rietal margin wanting.

Length 0.75 inch (19 millim.); breadth 0.40 inch (10 millim.).

Length of body whorl 0.50 inch (13 millim.).

Average weight 5.20 grains.

Station.—On the Lama, Hao, Ohia (*Eugenia Malacoensis*),
d Kukui (*Aleurites triloba*).

Habitat.—Halawa and Nuuanu, Oahu. J. T. G.!

Remarks.—This species completes the gradation between *A.*
warti Green and *A. colorata* Reeve.

XX.—*Description of a New Species of the Genus* CYPRÆA Linn.

By THEO. GILL.

Communicated by T. BLAND. *Read February 8th*, 1858.

Cypræa notata, Gill.

Plate IX. Fig. 1–3.

**_Cypræa_ testâ oblongo-ovatâ, lævi, politâ, dorso elevato; margine
erno incrassato, angulato; interno subrotundo; basi planulatâ; aper-**

turâ postice angustâ, flexuosâ, antice hiante; columellâ postice ventricosâ, antice subangustâ, planâ, plicâ marginali valido munitâ; dentibus columellaribus circa septemdecim, mediis tenuissimis, posterioribus paulo majoribus et anterioribus subvalidis; labii externi dentibus circa viginti duo, subæqualibus, parvis, brevibus; extremitatibus productis; incisurâ siphonale semi-ovatâ, vix obliquâ; spirâ umbilicatâ, lineâ dorsali obsoletâ.

Dorso colore cœrulescente, marulâ rufescente-purpureâ sub-centrali et lineis stramineis undulatis longitudinalibus obscuris ornato; lateribus luteis; basi carneâ; marginibus maculis hepaticis numerosis ornatis; extremitatibus utrinque et plicâ marginali violaceis.

Shell smooth, polished, oblong-ovate, with the back posteriorly elevated and thence declining with a gentle curvature towards the anterior part; external margin thickened, angular, and the inflected lip flattened; internal margin almost round; base nearly flat; aperture behind narrow and flexuous, before gaping; columella posteriorly rather ventricose, anteriorly rather narrow, flattened and armed with a strong marginal plait (or tooth); the number of the columellar teeth about seventeen, of which the middle are very delicate, the posterior

Length 23, width 14, height 11 millim.

Habitat.—East Indies.

Remarks.—This handsome cowrie, of which I have only seen the one above described, was found by Mr. David W. Ferguson of the city of Brooklyn, among a small lot of Cypræ said to have been obtained at Singapore, among which were *C. zigzag* Linn., *C. fimbriata* Gm., *C. poraria* Linn., and several other species well known as inhabitants of the great Indo-Pacific province. The specimen is now in Mr. Ferguson's Cabinet, and to him I am indebted for the opportunity of describing it. It appears to be very distinct from any of the species of the genus hitherto described. In the color of the extremities it has some resemblance to *C. fimbriata* Gm., and *C. microdon* Gray, but the much larger size, the more elevated back, the narrower umbilicated spire, the color of the base and sides, the absence of any appearance of bands, and especially the large and distinct spots on the margins, at once distinguish it from either of those species. The teeth on the posterior and middle portions of the columellar lip are also smaller than in those species, and the number of teeth in both lips is greater than in *C. fimbriata* and less than in *C. microdon*. In its general form and appearance it has some resemblance to *C. Goodallii* and *C. contaminata*, but in every other respect it is very dissimilar.

With all these distinctive characters, I cannot hesitate to regard it as very different from any species with which I am acquainted, although I have only seen a single specimen. It has no appearance of malformation, and its color is very characteristic.

XXXI.—*Descriptions of Seven New Species of Humming-Birds.*

By George N. Lawrence.

Read February 15th, 1858.

Phæthornis moorei.

Moore's Hermit.

Whole upper plumage and wing-coverts rather dull bronzy green, darker on the head, all the feathers with dark subterminal margins edged with grey; rump and upper tail-coverts of the same color as the back, but having the dark markings more distinct and terminating with pale rufous; tail bronzy green at the base for about two thirds of its length, remaining portion brownish-black, forming a broad subterminal band, the four lateral feathers on each side narrowly edged with pale rufous at the end for a short space on each web, and the two central feathers white on their projecting portion for about one third their entire length; wings purplish-brown; under sur-

I have named this species after its discoverer, Mr. Wm. E. oore, as a tribute to his enterprise and indefatigable persever-nce in accomplishing a journey across the entire continent of outh America near the Equator, unaided, and for a great ortion of the way unaccompanied, except by Indian guides.

Phæthornis villosus.

THE SHAGGY HERMIT.

Upper plumage dark bronzy green, inclining to dark brown n the head; upper tail-coverts dark green, with crescentic narkings of blackish brown near the end of each feather, which erminate with grey slightly tinged with rufous; tail very dark reen at the base for half its length, and as far as this color xtends the shafts are white, except on the two central ones, where they are dark; remaining portion of the tail brownish lack, with the lateral feathers narrowly edged with white on heir inner webs near the end, and a broader mark of white on he corresponding edge of the outer webs, the projecting ends of he central feathers gradually fade into white; a greyish line ehind the eye, also one running underneath it; ear-coverts lackish brown; neck and breast ashy brown intermixed with reyish white, producing a very rough, shaggy appearance; a istinct white line runs from the bill down the centre of the hroat to the breast; abdomen greyish white; under tail-overts ashy brown with white margins; wings purplish rown; upper mandible black, lower yellow at the base for early two-thirds its length, remainder blackish; iris black; feet yellow.

Length 5¾ inches; wing 2¼; bill 1¼; tail 2⅜.

Habitat.—Ecuador. Santa Fe de Bogota.

Remarks.—This bird seems closely allied to *P. hispidus* Gould, but is smaller and has not the uniformly colored under plumage, with the peculiar well defined markings on the throat and breast, as given in Mr. Gould's figures of that species.

Phæthornis atrimentalis.

THE BLACK-CHINNED HERMIT.

Crown and hind neck dull bronzy brown; back and wing-coverts rather bright dark green; upper tail-coverts green, edged with deep bright rufous; tail dull bronzy green, shading into brownish green towards the end, the two central feathers project a little beyond the others, where they are buffy white, lighter at the tips; the two next feathers on each side narrowly edged near the end with pale buff, and tipped with white, the two outer darker in color, with margins and tips of pale buff; wings dull purple; ear-coverts black, bordered above and below with a line of pale rufous; chin and upper part of the throat black; lower part of the neck and upper part of the breast dull greyish rufous; abdomen and sides bright rufous; under tail-coverts pale rufous; upper mandible and apical half of the lower deep black, basal half of the lower yellow; iris side greyish white; wings purplish brown; under plumage deep rufous, with a broad blackish purple band ($\frac{3}{16}$ of an inch in width) entirely crossing the breast; ear-coverts black; superciliary line rufous; upper mandible black, lower orange red becoming paler towards the end, the extreme tip black; iris black; feet yellow.

Length $3\frac{4}{16}$ inches; wing $1\frac{1}{16}$; bill $\frac{11}{16}$; tail 1.

Habitat.—Ecuador.

Remarks.—Resembles *P. episcopus*, Gould, but is smaller and dark green above, that species being golden brown; it may be distinguished from all the small species by its orange red under mandible.

Glaucis affinis.

THE ALLIED HERMIT.

Top of the head dark brown, back and wing-coverts shining grass green; upper tail-coverts fringed with greyish rufous; chin dark brownish grey; centre of throat dull brownish rufous; sides of the neck and breast dull dark green intermixed with rufous; abdomen and sides pale rufous; under tail-coverts white, with their centres very pale fawn color; two central tail feathers dark green tipped with white, inside of which is a narrow black band, the other tail feathers are chestnut red for two-thirds their length from the base, remaining part purplish black with white tips; wings purplish brown; upper mandible black, lower yellow with the tip black; iris black; feet pale yellow.

Length $4\frac{1}{2}$ inches; wing $2\frac{5}{16}$; bill $1\frac{3}{16}$; tail $1\frac{3}{8}$.

Habitat.—Ecuador.

Remarks.—This species is a near ally of *G. hirsutus*, and it is with some hesitation I have ventured to characterize it as distinct; Mr. Gould in his Monograph of the Trochilidæ under *G. hirsutus* speaks of a bird from Bogota "which has the throat and abdomen much suffused with green," which he thinks nearly allied to *hirsutus*, and possibly different; but he does not incline to give it a distinct specific appellation until further light is obtained. The example I have described above may be the same as the Bogota bird, but differs so much in the sombre coloring of its under plumage, from the more uniform rufous which prevails on those parts in all the specimens of *hispidus* I have seen, from Cayenne, Trinidad, &c., and in the much darker green of its upper plumage, that I cannot but regard them as different species.

Campylopterus splendens.

THE BRILLIANT-CRESTED SABRE-WING.

Front and entire crown golden green, brilliantly metallic; upper plumage and wing-coverts dark golden green; upper tail-coverts deep grass green; two central tail feathers dark metallic crown, absence of white on the lateral tail-feathers, and dull colored abdomen.

Ionolaima frontalis.

The Emerald-Fronted Humming-Bird.

On the forehead, immediately adjoining the bill, is a diamond shaped spot of brilliant metallic green; upper plumage and wing-coverts dark green, grass green on the head, but with a golden shade on the back; upper tail-coverts dark green; tail deep steel-blue, extreme tips of the two central feathers green; wings purplish brown, outer edge of first primary chestnut; chin, cheeks, and upper part of throat black; ear-coverts bronzed green; on the throat is a gorget (rather circular in form) of shining violet purple; adjoining this and occupying the upper part of the breast, is a band of metallic green of the same shade as the frontal spot; sides dark green, similar in color to the back; lower part of the breast and abdomen of the same deep black as the throat; under tail-coverts steel-blue; bill black; feet brownish black.

In one specimen, not fully mature, the frontal spot is wanting, and the bright feathers on the throat are only partially developed; there is a line of bright rufous feathers running from the bill under the eye, in all other respects precisely like the adult.

Length 5½ inches; wing 3; bill ⅞; tail 2⅜.

Habitat.—Ecuador.

Remarks.—This makes the second species of this genus, and is even a handsomer bird than *Schreibersi*, which it much resembles; it is, however, larger, and differs in having an emerald spot on the forehead; in the adult being destitute of a buff line on the sides of the head; in having the centre of the abdomen black, and the tail more deeply forked, the outer feathers being over an inch longer than the middle ones, whereas in *Schreibersi* the difference is but half an inch. The latter bird differs also in having the central tail feathers green.

The above described Humming-Birds form part of the collection (now in my possession) made by Mr. Wm. E. Moore, on his recent travels in South America. The subjoined extract from one of his letters will give the locality where they were obtained:—

"The Humming-Birds I gave you were all collected between the head waters of the Napo and Quito; this journey was performed on foot, three hundred miles through a dense forest, at the base of the Bolivian range of the Andes."

XXXII.—*Descriptions of two New Species of Gulls in the Museum of the Smithsonian Institution at Washington.*

By George N. Lawrence.

mandible beyond the nostrils, and the angle of the lower mandible, which are orange yellow; both mandibles have their tips pale yellow; legs and feet greenish yellow.

Length $17\frac{1}{2}$ inches; alar extent $43\frac{1}{4}$; wing $13\frac{3}{4}$; tail $5\frac{1}{2}$; bill $1\frac{5}{16}$; tarsi $1\frac{5}{8}$.

Habitat.—North Pacific, Puget Sound.

The adult, in winter, has the head and neck mottled with dark ash.

One specimen, not quite mature, has the wing-coverts edged with brownish ash, and the remnant of a subterminal black band upon the tail; bill blackish brown.

Two specimens which I think are the young of this species, have the head, neck, and under surface greyish white, mottled with light ash, darker on the breast; upper and under tail coverts barred with brownish ash; upper plumage dark ash mottled with grey, the pearl blue color of the back just beginning to appear; wing-coverts, secondaries, and tertiaries brownish ash, margined with dull white; primaries dark brown, the inner ones light cinereous on the inner webs, tips edged with dull white; tail dark brown, ashy white at the base and narrowly tipped with the same color; bill flesh color at the base for about half its length, remainder black; iris hazel; tarsi and feet flesh color.

One measures in length $17\frac{1}{4}$ inches; wing $13\frac{1}{4}$; tail $5\frac{1}{4}$; bill $1\frac{1}{4}$, depth at angle $\frac{3}{8}$; tarsus $1\frac{7}{8}$, middle toe and claw $1\frac{3}{4}$. The other specimen is rather smaller.

I have conferred upon this species the name of Dr. Geo. Suckley, whose interest in science is fully attested by the numerous specimens collected by him, and now in the Museum of the Smithsonian Institution.

It is allied to *L. zonorhynchus*, but the mantle is darker; the bill shorter and more slender than in that species, being only about two thirds as large.

Rissa septentrionalis.

The North Pacific Kittiwake.

Adult. Head, neck, under surface, bend of the wing and tail pure white; back and wings light pearl blue; the first primary is black for about half its length from the end, with a white spot one and a half inches long, crossing both webs near the tip, which is black; the second primary is black for about one third the distance from its end, and having also a white spot (but less in extent) inside the black tip, the next five primaries are black at their ends, with white tips, but the black decreases in extent from the second, until it exists only as a spot on the seventh; basal portion of the primaries bluish-ash fading into white where it joins the black, except on the first and second; secondaries and tertiaries terminating with white; bill of a dusky-green for two thirds its length from the base, apical third yellow, which deepens to orange on the ridge of the upper mandible, and the angle of the lower; tarsi and feet

XXXIII.—*Notes on some Cuban Birds, with Descriptions of three New Species.*

By John Gundlach, Ph. D., Corresponding Member.

Read June 29th, 1857.

I. Cypselidæ of Cuba.

Mr. D'Orbigny, in his descriptions of the Birds of Cuba, published in "La Sagra's Natural History of the Island," 1841, only mentions one species of Swallow, *H. purpurea*, but observes that he did not doubt several more could be found, when the interior should be explored. This has been accomplished. Mr. Lembeye, in his work on the Birds of Cuba, 1850, Havana, availing himself of my observations and discoveries, mentions four Hirundidæ, and adds to the family of Cypselidæ (Swifts) *Cyp. Iradii* Lemb. Mr. Philip Henry Gosse, in his "Birds of Jamaica," published in 1847, describes three swallows and three swifts. These are divided into three genera, Acanthylis, Tachornis, and Cypselus.

During my residence of 17 years on the western part of the Island, I had only observed the species *Cyp. Iradii*, but in my present travel of discovery, I have found not only in the mountains between Cienfuegos and Trinidad on the southern coast, but in the eastern parts in the Sierra Maestra, the *Cyp. Collaris*, Pr. Max., and *Cyp. niger* (*Hirundo niger*), Gmel.

I will now describe these, and add the observations I have been able to make respecting them.

1. Cypselus collaris, Pr. Max.

Mr. Gosse describes it under the name of *Acanthylis collaris?* Ringed gowrie; but as the characteristics of this genus consist in the points at the end of the tail feathers, and the greater or less rounding of the tail, I cannot consider it as belonging to this genus, though it possesses those pointed ends of the shafts.

Plumage in both sexes: sooty black with some green reflections: throat black without reflections, lores black. A band from the bill to the upper part of the eye has the ends of the feathers white. A white ring round the neck, broader on the breast, the feathers being of a dark color at their base. Tail forked, composed of ten feathers, the difference between the middle and outer being of 0.009. All the tail feathers have their ends pointed, and the shafts extend beyond the vanes, though commonly worn. The first quill is the longest. Bill and feet black, the latter with a purplish tint. Eye almost black.

	MALE.	FEMALE.
Length	0.216	0.221
Extent	0.518	0.532
Tail	0.072	0.073

It seems that this species lives and breeds in the highest parts of the mountains, being only seen in the plains and low grounds the bill to the upper part of the eye; lores black; sides of the head and throat greyish black; the rest of the plumage sooty brown, with slight green reflections. Tail forked, composed of ten feathers. Difference between the middle and outer 0.012, the shafts are not strong. First quill the longest, but sometimes it is the second, perhaps in young birds. Bill, feet, and eyes as in the preceding species. The young are distinguished from the adult, by their tail being square, and the feathers of the lower parts have a whitish tint at their ends.

Length	0.173
Extent	0.390
Tail	0.066

I saw these birds for the first time in the month of May, when they commonly arrived every morning about one hour after sunrise, and flew in a circular direction over the river near Bayamo, at a considerable height, making their evolutions always in the same place, perhaps employed in catching the insects attracted there by the proximity of the river. In the month of June they arrived every day towards noon when it threatened to rain, and sometimes returned again after sunset. The two other species mix with the present in the same flock. When tired of their exercise they always flew together towards the mountains, where I am inclined to suppose exist their breeding places. When one of the birds flies in chase of another, it emits a soft continued note not unlike a song. Having killed many young birds in the month of June, I suppose that they breed in April and May. Mr. Gosse found only one specimen of this bird in Jamaica, which he named Black Swift.

3. Tachornis iradii, Lemb.

This bird, described in Lembeye's Birds of Cuba, page 49, and figured in pl. vii. fig. 4, resembles the *Tachornis phenicobius*

Gosse, of Jamaica, for which reason it bears this name in the "*Journal für Ornithologie* IV., *Jahrgang No.* 19, *Januar*, 1856, *page* 5," where my notes, and the ornithological catologue I had sent to Hessen Cassel, are published. I have not yet compared specimens from both islands, and in the description I had not noticed that Gosse's bird has the under wing and tail coverts of a dirty white, and besides has not the white so conspicuous on the rump. Our bird must be considered as a different species.

Plumage: Male; sooty brown, darker on the head, with slight green reflections on the back and tail. Throat, breast, belly, and vent silky white. Cheeks and sides of the breast brownish. Tail slightly forked, and composed of ten feathers. Difference between the middle and outer 0.015.

The female has the sides of the breast lighter, and the whole of the lower parts except the wing and tail coverts, of a dirty silky white.

The only perceptible difference in young birds is, their having the white parts darker.

MALE. FEMALE.

Several birds enter the same places, and even during the day they resort to them for rest.

When their breeding season arrives, they fasten cotton, and vegetable wool from various plants, to one of the sides of their retreat, mixing leaves and feathers, till the nest is completed, leaving only a narrow space between the nest and the opposite side for an entrance. I have not yet ascertained whether the substance employed by the birds is their saliva, or some resinous matter. The great difference in the size of the nests induces me to suppose that they repair their old nests, returning to them at each succeeding season.

They lay three and sometimes four white eggs of 0.016 by 0.011. As I found fully fledged young in the beginning of June, and also fresh eggs in the first days of July, we may suppose that their breeding takes place from the end of April to the middle of July.

II. Myiadestes Elisabeth, Lemb.

Muscicapa Elisabeth, Lemb. Aves de Cuba, p. 39, pl. 5, fig. 3. This species belongs to the genus Myiadestes, in which must also be included *Ptilogonys Townsendi* Aud., and *Ptilogonys armillatus* Gray, of Jamaica.

My present object is to give a more extensive description of this remarkable bird, than that found in Lembeye's work.

Both sexes: vertex, back, lesser wing-coverts, last scapulars, and middle tail feathers olivaceous ash, sides of the throat and rump more greyish. Lores and upper part of the ear ferruginous ash, a lighter circle of this color around the eye. Greater wing-coverts and primary quills brown, with the inner edge olivaceous ash. From the 7th to the 16th quill their base is of an olivaceous bay color, and from the middle to the end the same, the intermediate space being brown with an olivaceous edge; the tip whitish. Tail feathers, except the two middle, brown, the 5th ashy olive in its exterior vanes with narrow dark bands. The second has a triangular white spot at the end, principally on the inner vanes, in the first or outer feather it extends beyond the middle, and in the exterior vanes it reaches ⅔ of its length.

Lower parts whitish, with a greyish tint on the breast and sides. A dark line from the base of the bill forms a small mustache. Tail rounded, composed of 12 feathers. The 4th and 5th quills the longest; 1st very short, 6th equal to the 5th, the 3d longer than the 7th, the 2d equal to the 8th. Bill of a horn color, with the base of the lower mandible orange yellow. Feet of this last color, with the scutella darker. Iris dark hazel.

Length	2¾	inches—Spanish measure.
Extent	12¼	"
Tail	$3\frac{7}{12}$	"

The tail extends 2¼ inches beyond the end of the wing. The young have the upper parts of a stronger olive color, and the lesser quills darker, with a small bay patch towards the end. Lower parts and vent, bill, feet, and eyes, as in the adult.

It is a retired bird and fond of living alone, like the bird of Jamaica (*M. armillatus*), which has there received the name of "Solitaire."

III. Descriptions of New Species.

1. Colaptes chrysocaulosus.*

Upper part of head and hind neck bluish ash-grey, with an occipital band of deep scarlet; back and wing-coverts light hair brown, with broad transverse bars of black; rump greyish-white spotted, and barred with black; tail dark umber brown terminating with black, lateral feathers barred on their outer webs with buffy white, outer margin of the other tail-feathers with spots of the same; under surface of the tail, deep golden yellow with black tips; upper and under tail-coverts barred with black and white; primaries dark umber brown; secondaries and tertiaries dark brown, with broad marginal spots of light hair brown; inner surface of wings dusky yellow; shafts of the quill feathers bright yellow; shafts of the tail feathers the same color, except for a short space at the end, where they are black; sides of the head and neck in front, of a reddish fawn color; a broad crescent of black on the breast; breast and sides yellowish brown; abdomen pale yellowish white, with circular black spots over the entire under surface below the gorget; bill bluish black; tarsi and feet dark lead-color.

Length 11¾ inches; wing 5⅝; bill 1⅜; tail 4⅝; tarsi 1⅛ inches, English measure.

2. Culicivora lembeyei.

Entire upper plumage dull plumbeous-grey, rather lighter on the tail-coverts; a crescentic black line extends from behind the eye around the ear-coverts to the side of the neck; wings brownish-black, with the outer margins grey; tail deep black, with the outer feather white on the outer web and the terminal half of the inner, the next feather white on the inner web for its terminal quarter, and on the outer web nearly to the base, end and outer edge only of the third lateral feather white; ear-coverts and under surface very light greyish-white, nearly pure white on the centre of the abdomen; bill black, except at the base of the lower mandible, where it is lead-colored; tarsi and feet dark plumbeous.

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* Composed of χρυσος καυλος, golden shaft.

	MALE.	FEMALE.
Length	0.124	0.122
Extent	0.137	0.135
Tail	0.051	0.051

This bird lives in open grounds on the Eastern part of the Island, and begins to breed towards the latter end of April, building its nest in thick bushes six or eight feet from the ground, and composed of hair, vegetable wool, and other soft of abdomen bright yellow; lower part of abdomen and greyish-white; the under tail-coverts white in some speci-s, in others yellow; upper mandible and terminal half of the r black, basal half of the latter lead-colored; iris dark l; legs and feet plumbeous.

ie plumage does not differ materially in either sex or age.

	MALE.	FEMALE.
Length	0.132	0.129
Extent	0.182	0.177
Tail	0.054	0.052

n the first days of May it builds its nest in bushes, from 3 to t from the ground, employing small roots and lining it with The number of eggs is three, 0.019–0.014, of a white r inclining to blue, with irregular lilac and reddish spots.

its manners it has much resemblance to the *Anabates iandinæ*, Lemb., constantly hopping upward from the lowest ches to the highest, on reaching which it flies to the om of another bush, and again hopping towards the top. r also visit high trees, and continually search with the test care for the insects and caterpillars, which vainly avor to hide from their penetrating glance. When two or meet on the same tree they emit a querulous note as if were engaged in conflict, for which reason Cabanis gave pecies the name of Teretistris (*See Journal für Ornitho-*, *Jahrgang No.* 18, *November* 1855, *pag.* 475).

iis species lives only in the eastern part of the island, and *ernandinæ* inhabits the western.

OBSERVATIONS ON THE PRECEDING PAPER.

By Geo. N. Lawrence.

ith the above communication transmitted by our correspondent Dr. Gundlach for publication in the Annals, he was so kind as to send me specimens of all the birds therein described and noticed. Two of his new discoveries are nearly related to species belonging to our Fauna, viz.

1. P. CHRYSOCAULOSUS. Resembles "*P. auratus*" but differs from it in being smaller, in having the abdomen more closely spotted, and the spots on the breast larger, the tail feathers are narrower, and of a deeper yellow; the wings are relatively shorter, the legs and feet much stronger, the bill is straighter and not so pointed at the end, the red occipital band is deeper in color.

2. C. LEMBEYEI. This is a more diminutive species than "*C. cærulea*," being about half an inch less in length; the color is much more grey. It may be distinguished at once from all other species, by the black line which extends partially around the ear-coverts.

Dr. G. sends no description of the female; it probably is destitute of the black mark on the side of the head.

It is a matter of surprise that the two species of Cypselus derates it as a bird of Jamaica, but did not meet with it. He gives only a short description of it from a specimen obtained previous to his arrival, without any account of its habits. There is much interest attached to this species just at present, from the fact that Dr. Kennerly has recently described (in the Proc. of the Acad. of Nat. Sci. Phil., Nov. 1857) a large Cypselus (*C. borealis*), obtained by him in Washington Territory near Puget Sound; the description as given by him, agrees so closely with the specimen of *C. niger* before me, that I cannot but think they will prove to be identical. The only noticeable difference is, that the wing of his bird measures about half an inch more in length from flexure to tip.

XXXIV.—*Descriptions of Two New Species of North American Helicidæ.*

By Thos. Bland.

Read February 15th, 1858.

1.—Helix Edvardsi.

Plate IX. Fig. 14–16.

T. imperforatâ, lenticulari, carinatâ, tenuiusculâ, fulvâ; epidermide castaneâ, supra in striis pilosis prostratis minutis elevatâ,—infra tuberculis acutis minutis creberrime munitâ, quæ juxta aperturam setos erectos gerunt; spirâ convexo-conoideâ; anfr. 5, complanatis, lente accrescentibus; ultimo antice gibbo, subito subdeflexo; apice minute granulato; basi convexo, parum indentatâ, lineis numerosis spiralibus sub epidermide impressis; suturâ profunde impressâ; aperturâ obliquâ, transversâ, auriformi; dente angustâ, subarcuatâ, lamelliformi, prælongâ, parietis aperturalis coarctatâ; perist. margine supero acuto, parum reflexo, infero subarcuato, depresso, subreflexo, et ad anfractum ultimum subappresso, callo dentiformi intus instructo, obsolete inciso.

Shell imperforate, lenticular, carinate, the carina obsolete near the aperture, rather thin, beneath the epidermis pale brown; the epidermis dark chestnut color, with numerous minute curved hair-like processes lying flat upon, and attached to the epidermidal surface of the upper whorls in the direction of the incremental striæ, the epidermis at the base covered with acute, raised, transverse tubercles, most numerous, and having erect bristles near the aperture; spire convex-conoid; whorls five, flattened, gradually increasing, the last gibbous above, suddenly but slightly deflected; apex minutely granulate; base convex, little indented in the umbilical region, and with impressed spiral lines beneath the epidermis; suture deeply impressed; aperture oblique, transverse, auriform, narrowed by a slender slightly arcuate lamelliform parietal tooth extending across from the umbilical axis, and terminating with a short angular deflection within the aperture; upper margin of the peristome acute, scarcely reflected, lower margin slightly arcuate, depressed, slightly reflected, and partially appressed to the body whorl, with a tooth-like callus within, having an almost obsolete notch in the centre.

Diam. maj. 9, min. 8, alt. 5 mill.

lete, are observable at the base of the former, while in the latter, the basal epidermis approaches in character to that of *H. palliata* Say. The deep characteristic notch in *H. hirsuta* is considerably less developed in *H. Edwardsi*, and the callus which connects the parietal tooth with the upper margin of the peristome in the former, does not exist in the latter. In the general character of the peristome the species under consideration resembles *H. hirsuta*, while *H. barbigera* is in that particular more appropriately compared with *H. fraterna* Say.

While naming this species after my friend Mr. Edwards, who collected it, I am quite aware of the objections to such specific names, but in the Genus Helix it seems almost a hopeless case to find, for a shell closely allied to several others, an unpreoccupied name derived from any distinct specific character.

2.—Helix sculptilis.

Plate IX. Fig. 11–13.

T. obtecte perforatâ, suborbiculari, depressâ, subpellucidâ, pallide corneâ, nitenti, lineis transversis regularibus concinne impressâ; spirâ parum elevatâ, subconvexâ; anfr. 7, planulatis, ultimo rapide accrescente, prope aperturam ⅓ diam. subæquanti; basi planulatâ, leviter excavatâ; suturâ parum impressâ; aperturâ subobliquâ, depressâ, transversâ, lunari; perist. simplici, acuto, sinuato, margine columellari rapide et anguste reflexâ, et perforationem minutam tegenti.

Shell scarcely perforate, suborbicular, depressed, subpellucid, pale horn color above, of lighter shade beneath, shining, with regular, subequidistant, impressed transverse lines, those on the last whorl extending over the periphery, and converging in the umbilical excavation; spire very little elevated, scarcely convex; whorls 7, planulate, the last rapidly increasing, equal at the aperture to ⅓ the diam. of the shell, beneath flattened, and little excavated in the umbilical region; suture lightly impressed; aperture scarcely oblique, depressed, transverse, lunate; peristome simple, acute, sinuate, the columellar margin very rapidly and narrowly reflected over, and almost entirely covering the very small perforation.

Diam. maj. 12½, min. 11, alt. 5 mill.

Habitat.—"The Anantehely Mountains, which are a local spur of the Alleghany Mountains in North Carolina, just where that State touches Georgia and Tennessee." Bishop Elliott!

A single specimen of this very interesting species was found in the locality above mentioned, by Bishop Elliott, in whose cabinet I noticed it some months ago. In sculpture it is closely allied to *H. indentata* Say, of which it might almost be termed a gigantic variety, but the impressed striæ are more numerous, and closer together. The form of the aperture is very near that of *H. inornata* Binney.*

The general aspect of this shell reminds one of the Asiatic group, to which *H. resplendens* Phil. and *H. vitrinoides* Desh. belong.

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regarding them. This is particularly the case as to some of the species described by Thomas Say. To a considerable extent it may be attributed to the inaccessibility of Say's writings, now happily remedied by the recent publication of all relating to the terrestrial species by Mr. W. G. Binney.

Some of the species have been moreover hitherto rare, and seeing how much they vary, an extensive suite of specimens can alone enable a Conchologist to arrive at any satisfactory conclusion on points in dispute.

The valuable work of the late Dr. Amos Binney, only recently completed under the supervision of Dr. A. A. Gould, has added very much to our knowledge of the subject, but the text, written some years since, scarcely gives the information or the opinions as to several of the groups, which more recent study of them, and the present appreciation of the value of specific characters, would seem to demand and justify.

It is to be regretted that some of the specimens of the Land shells, deposited by Say at the Academy in Philadelphia, have been lost, and I fear that not all of those remaining are, strictly speaking, entirely reliable.

Mr. Isaac Lea has described a considerable number of species, and published figures of some of them, but the descriptions are generally by no means ample, and the figures not always satisfactory.

In Europe there has certainly been disregard of the writings of American authors, which, with the adoption there of Rafinesquean names, has added to the prevailing confusion.

Dr. Pfeiffer has published some grievous errors in his works, but has unquestionably been puzzled by the conflicting views of American Conchologists.

In reviewing the North American Land Shells, we must not overlook the fact, that in no part of the world have species such a wide distribution in latitude, owing it may be argued to the direction, from north to south, of the Rocky and Apalachian Mountain chains.

The fact of wide distribution of identical or closely allied forms is admitted, but how far attributable to the physical outlines of the Continent, or to circumstances connected with their original creation, are subjects of deep interest.*

Very many of the species present great variations,—so much so as to induce difference of opinion as to whether individuals should be considered simply varieties, or valid species. Our knowledge of the limits of variation is very circumscribed and unsatisfactory, and we know little or nothing of the causes of this variation,—whether due to physical circumstances or to creative power.

Several species have a tendency to run into, or are represented by acutely carinated forms; *H. alternata* Say is thus represented by *H. Cumberlandiana* Lea, *H. palliata* Say by *H. helicoides* Lea, *H. stenotrema* Fer. by *H. spinosa* Lea, and I may add *H. Troostiana* Lea by *H. fatigiata* Say. The metropolis of the carinated forms seems to be Tennessee.

The sculpturing and epidermis also greatly vary; the fine incremental striæ of the Ohio *H. alternata*, are replaced in the South by strongly developed ribs, and in some individuals of *H. palliata*, the rough epidermis described by Say is wholly

Having enjoyed the advantage of much intercourse, as well personal as by correspondence, with Mr. W. G. Binney, to whose liberality I am greatly indebted for very many specimens, and also for information derived from his numerous correspondents, and from a study of his late father's papers, and cabinet, I desire to publish my views on some of the North American species (especially those described by Say), in the hope that they will at least aid in the elucidation of questions regarding them.

For the extensive suite of specimens in my cabinet I am under much obligation to many friends and correspondents, and particularly to Bishop Elliott. I would also acknowledge the very interesting and instructive correspondence had two years ago with Mr. R. J. Shuttleworth.

My thanks are due to my friend Mr. Edward Magens for the excellent figures on Plate ix. which illustrate this paper.

Helix fatigiata Say.

Plate IX. Fig. 17—20.

SYNONYMY.

Polygyra[*] *fatigiata Say* Diss. of Useful Knowledge, II. p. 229. 1829.
——— " Desc. of some new Terr. and Fluv. Shells of N. Amer., p. 1. No. 3. 1840.
Helix *fatigiata Binn.* Bost. Jl. III., p. 388 ex parte (excl. Syn. et fig.) 1840.
—— *Texasiana var. B. Chemn.* ed. 2. Helix I., p. 86 (excl. desc. Syn. et fig.). 1846.
—— " *β. Pfr.* Mon. Hel. I. No. 1086 (excl. desc. et Syn.). 1848.

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[*] Mr. W. G. Binney informs me, that this specific name was written originally in Say's MS., *fastigiata.* Pfeiffer (Malak. Blatt. 1856) objects to *fatigiata* as not being a Latin word. The former would certainly be more correct, and was doubtless intended, but seeing that it has been used by Hutton for another species, I retain the latter.

Helix *Dorfeuilliana Desh.* Fer. Hist. I. p. 73, tab. 69 D. fig. 3. (excl. Syn.).
—— *Texasiana Desh.* l. c. p. 74 (excl. desc. Syn. et fig.).
—— *fatigiata Binn.* Terr. Moll. II. p. 193, ex parte (excl. Syn.) pl. xxxix. fig. 4. 1851.
—— " *Shuttl.* Diag. n. Moll. p. 17 (Bern. Mittheil.). 1852.
Polygyra " *W. G. Binn.* Reprint of Say's Descr. of Terr. Shells of N. Amer. p. 37. 1857.

In order to appreciate correctly Say's species, his remarkably lucid description and remarks should be carefully studied; for facility of reference I subjoin them:

"*Polygyra fatigiata.* Shell convex beneath, nearly plane above, the spire being hardly perceptibly elevated; whorls a little over six, compressed, acutely carinated, crossed by numerous raised, equidistant lines, which form grooves between them; superior surface not at all convex; aperture subreniform; labrum reflected, regularly arcuated, describing two-thirds of a circle; within two toothed, lower tooth conic obtuse, superior tooth compressed, transverse, placed further within the aperture than the inner one, from which it is separated by a wide and deep and obvious sinus; labrum with a very profound duplicature; which have been so much misapprehended. A specimen deposited by Say in the Cabinet of the Academy of Nat. Sci. of Philadelphia is still preserved there,—it entirely agrees with his description, and with Binney's figure (Pl. xxxix. fig. 4.), in the "Terrestrial Mollusks."

Dr. Binney in the Bost. Jl. unites *fatigiata* with *H. plicata* Say, *H. Troostiana* Lea, and *H. Dorfeuilliana* Lea, adopting the first specific name, that of *plicata*, otherwise having priority, being preoccupied. His figure (Pl. xix. fig. 3) represents *Troostiana* Lea, a nearly allied form. The same views are expressed in the Terr. Moll. Binney gives there two figures, one (Pl. xxxix. fig. 4) of *fatigiata*, and the other (fig. 2) of *Troostiana* under the name of *plicata*.

Pfeiffer treats *fatigiata* Binn. (*H. Troostiana* Lea), *H. plicata* Say, and *H. fatigiata* Say, as synonyms of *H. Texasiana* Mor., which is certainly quite distinct,—adopts *H. Troostiana* Lea as a good species, and confounds *H. Dorfeuilliana* Lea with another species.

The same errors prevail in Chemnitz (ed. 2), and in Reeve's Conch. Icon., in neither of which works is *fatigiata* Say figured.

Deshayes (Fer. Hist.) has *fatigiata* Say, and *fatigiata* Binn. in his synonymy of *H. Texasiana* Mor., but describes and refers to a figure of the former, under the name of *Dorfeuilliana* Lea, of which he gives *plicata* Say as synonym. He refers to a specimen in Ferussac's collection, labelled *plicata* Say, but Say's name being preoccupied adopts *Dorfeuilliana* Lea, mentioning that he had himself proposed *finitima*. He admits the specific value of *Troostiana* Lea, with much doubt.

Shuttleworth (Bern. Mittheil.) points out the errors of Pfeiffer, correctly determines *fatigiata* Say, and *Dorfeuilliana* Desh., and also *Texasiana* Mor., but at the date of that publication misconceived *Dorfeuilliana* Lea, and *plicata* Say.

In justice to Mr. Shuttleworth I subjoin a copy of his accurate description, and of his observations; they are in a work not readily met with in the United States, and I should add were not accepted by Pfeiffer in 1856 (vid. Malak. Blatt.).

HELIX FATIGIATA SAY.

"T. spurie umbilicato-perforata, superne plana, subtus inflato-convexa, acute carinata, plicato-striata, striis subtus exilioribus, corneo-rufescens, superne obscura, subtus nitidula; anfr. 6½, lente accrescentes, plani, ultimus ad aperturam brevissime deflexus et scrobiculato-constrictus, basi devius; sutura satis profunda; apertura subreniformis, valde coarctata; perist. albidum, reflexum, marginibus dente triangulari linguiformi profunde intrante junctis, dextro dente valido profunde immerso, basali dente minore submarginali munito.

"Diam. maj. 10, min. 9; alt. 3 mill.

"*Syn. Polygyra fatigiata* Say Descr. of some new Terr. and Fluv. Shells of N. Amer. p. 1, No. 3.

"*Helix Dorfeuilliana* Desh. in Fer. Hist., I. p. 73, et tab. 69 D. fig. 3.

"*Hab.* Spec. ultra 12 e Tennessee misit Lequereux:

"*Obs.* Sub nomine H. Texasianæ 3 species a cl. Pfeiffer confusæ sunt.

"1. H. fatigiata Binn., quæ ad H. Troostianam Lea (H. plicata Say), pertinet.

"2. H. fatigiata Say, supra descripta.

Troostiana, in which it is slightly emarginate near the tip,—but much more so in *plicata*, while the parietal tooth in *Dorfeuilliana* is rather quadrate. The teeth on the peristome in *fatigiata* and *Troostiana* are much alike, as regards form, size, and position,—the superior one being the largest,—both are larger and transverse in *Dorfeuilliana* and in *plicata*, the inferior one being the largest in the latter. Behind the peristome there are two small pits, showing the situation of the teeth in *fatigiata* and *Troostiana*, while there is scarcely more than a deep, well marked constriction in *Dorfeuilliana*. *H. Troostiana* has a slight groove on the inner side of the last whorl, the absence of which in *fatigiata* is noticed by Say, but I scarcely consider that a good specific character. Fresh specimens of *H. fatigiata* are, I believe, covered with a very thin epidermis, on which hairs are sparingly scattered,—the scars of the hairs may be detected, especially on the last whorl, in denuded shells.

H. fatigiata has, at a short distance within the aperture on the base of the last whorl, a small, detached, erect, rounded tubercle, answering probably the same purpose in the economy of the animal, as the "fulcrum"* originally noticed by Mr. Lea (Observations Vol. V. p. 80) in *H. spinosa*, though of a different construction.

The measurements of my specimens agree with those given by Shuttleworth.

For further illustration of the differences in the species in question, I refer to the accompanying figures.

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* In his "Notes on American Land Shells" (Proc. Acad. Nat. Sc., Phila. Oct. 1857), Mr. W. G. Binney mentions having a specimen of *H. fallax* Say, in which there is "a well developed *fulcrum* as in *H. spinosa*, &c." I should explain that he received the specimen referred to from me (one of several given to me by Dr. Budd), and that it is by no means *H. fallax*,—rather a very large form of *H. vultuosa* Gould, or its close ally. In the latter species, as well as in Mr. Binney's shell, there is a short, somewhat transversely elongated tubercle, not rounded and obtuse, though in the same situation as in *H. fatigiata*. There is no such process in *H. fallax*.

For fine specimens of *H. fatigiata Say* from Tennessee, I am under obligation to the late Judge Tappan, and to Mr. J. G. Anthony.

Helix Troostiana Lea.

Plate IX. Fig. 21–23.

SYNONYMY.

Polygyra *Troostiana Lea* Trans. Am. Phil. Soc. VI. p. 107. Pl. xxiv. fig. 119. 1838.
Helix *fatigiata Binn.* Bost. Jl. III. p. 388, ex parte (excl. Syn.)—pl. xix. fig. 3. 1840.
—— *Troostiana Pfr.* Mon. Hel. I. No. 1088. 1848.
—— " *Desh.* in Fer. Hist. I. p. 75, tab. 69 D. fig. 4 ?
—— " *Chemn.* ed. 2, Helix I. p. 376, tab. 65. fig. 21–24.
—— *fatigiata Binn.* Terr. Moll. II. p. 193 ex parte (excl. Syn.) 1851.
—— *plicata* " " " III. tab. xxxix. fig. 2.
—— *Troostiana Rv.* Conch. Icon. Helix. No. 706. pl. cxx. fig. 702. 1852.
—— *plicata Shuttl.* Diag. n. Moll. p. 18 (Bern. Mitth.). 1852.

racters. It differs, however, in the large solid tooth on the left lip being more angular, and in the two teeth on the right lip being somewhat differently placed. In the striæ it differs much, these being larger, much better defined, and passing over the whorls. In the umbilicus it is wider, and shows more of the two whorls. This shell forms the fourth of a group, the form of the apertures of which is exceedingly alike, viz. *P. fatigiata* Say, *P. plicata* Say,* and *P. Dorfeuilliana* Nob."

As already mentioned, Binney gives a figure of this species in the Boston Jl. as *fatigiata* Say, and in the Terr. Moll. as *plicata* Say.

In Pfeiffer's Mon., in Chemnitz (ed. 2), and in Reeve's Conch. Icon. no doubt is expressed as to *Troostiana* being a good species. The figures in the two latter works appear certainly to be of Lea's shell.

Deshayes, in Fer. Hist., refers to its close affinity with his *Dorfeuilliana* (*fatigiata* Say), of which he is inclined to treat it as a variety,—the figure to which he refers (Pl. 69 D. fig. 4) is not altogether satisfactory.

Shuttleworth in Diag. n. Moll. (1852), as already quoted, erroneously considered *Troostiana* Lea identical with *plicata* Say, and in his observations on *H. Dysoni*,† in the same work, as scarcely more than a variety of *Dorfeuilliana* Lea, but he subsequently entertained a different opinion, as I shall presently explain.

Lea's description is unfortunately meagre, and his magnified figure, copied on Pl. IX. fig. 22, does not correctly show the parietal tooth,—its form, indeed, as figured, might be referred to *H. plicata*, but the size, form, and position of the two other teeth agree with *Troostiana*.

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* Mr. Lea in his remarks on *H. Troostiana* and *H. Dorfeuilliana*, refers to *H. plicata* Say, but in fact alluded to *H. pustula* Fer., labelled *plicata* Say in his cabinet.

† For copy of the description and observations on this species see p. 295.

Mr. Lea has kindly allowed me to examine his original specimen, which differs from mine only in having the parietal tooth somewhat more emarginate.

H. Troostiana is very closely allied to *H. fatigiata* Say, from which I separate it with some hesitation. In its fresh state it has a thin, sparingly hirsute epidermis. I have moreover two specimens in my cabinet (both hirsute), which are as acutely carinated as *fatigiata*, with the striæ as prominent below as above,—(in one more numerous), but both having the parietal tooth of *Troostiana.*

I am not altogether satisfied with the validity of Shuttleworth's remark, that the superior tooth in *fatigiata* is larger and more conspicuous than in *Troostiana.*

This species has the same tubercle within the last whorl as *H. fatigiata.*

The following are the measurements of my specimens,—of one received from Judge Tappan, and agreeing with Mr. Lea's.

Diam. maj. 8, min. 7, alt. 3.

Var. b.—carinata. Diam. maj. 9, min. 8, alt. 3.

Var. c.—minor. Carinate, and with striæ below more numerenounces the above opinion, believes with me that *H. Troostiana* Lea and *H. plicata* Say are distinct, and admits that the Bishop's specimens are of the latter species.

There is a good specimen of *H. Troostiana* Lea in the cabinet of the Academy, which was, I learn, received from Mr. Sowerby.

For examples of this species from Tennessee, I am indebted to the late Judge Tappan, and to Mr. Postell of St. Simon's Island, Ga.

Helix Hazardi.

Plate IX. Fig. 27–30.

SYNONYMY.

Polygyra *plicata Say* Jl. Acad. Nat. Sci. Phila. Vol. II. p. 161. 1821.
Helix *fatigiata Binn.* Bost. Jl. III. p. 388 ex parte (excl. Syn. et pl. xix. fig. 3). 1840.
—— *Texasiana Pfr.* Mon. Hel. I. p. 418 (excl. desc. et Syn.). 1848.
—— *Dorfeuilliana Desh.* in Fer. Hist. I. p. 73 (excl. desc. Syn. et fig.).
—— *Texasiana Chem.* ed. 2 Helix. I. p. 85 (excl. desc. Syn. et fig).
—— *fatigiata Binn.* Terr. Moll. II. p. 193 ex parte (excl. pl. xxxix. fig. 2). 1851.
—— *plicata W. G. Binney* Reprint of Say's Desc. of Terr. Shells of N. Amer. 1856.
Polygyra *Troostiana W. G. Binney* Notes on Amer. Land Shells, Proc. Acad. Nat. Sci. Phila. p. 21. 1857.

The following is Say's description with which his explanatory remarks, accompanying the description of *H. fatigiata*, should be studied.

"*Polygyra plicata.*—Shell convex beneath, depressed above, spire slightly elevated; whorls five, compressed, crossed by numerous raised, equidistant lines, which form grooves between them; aperture subreniform, labrum reflected, regularly arcuated, describing two-thirds of a circle; within two-toothed, teeth not separated by a remarkable sinus; labrum with a profound duplicature, which terminates in an acute angle at the centre of the aperture; beneath exhibiting only two volutions, of which the external one is slightly grooved near the suture.

"Inhabits Alabama. Breadth one-fourth of an inch. Cabinet of the Academy.

"This species is about the same size as *P. avara*,* but, besides other characters, it is sufficiently distinguished by the acute fold of the labrum. It was sent to the Academy by Mr. Samuel Hazard."

No author appears to have correctly identified this species. If distinct, as I fully believe it to be, the name must be changed, inasmuch as *H. plicata* Born is of prior date. Mr. W. G. Binney informs me that in Say's MS. there is an erased remark as to the name being pre-occupied, and proposing *beta*. As Pfeiffer has already trespassed on the Greek alphabet, I would suggest the propriety of dedicating the species to its discoverer, Mr. Hazard.

This shell may be distinguished from *fatigiata* Say, and shallow pits, giving the character to the last whorl designated by Shuttleworth "*scrobiculato-constrictus*,"—the striæ run over the whorl up to the peristome. In *H. Hazardi*, the two teeth on the peristome are of the same character as the superior one in *fatigiata* and *Troostiana*,—the inferior tooth is however the largest, and so partially conceals the lower margin of the superior one as to obstruct the view into the aperture, and give no appearance of separation "by a remarkable sinus." Both the teeth are more deeply seated than in the other species. The nature of the scrobiculation behind the peristome in *H. Hazardi* alone sufficiently distinguishes it from its allies. The space behind the peristome, and between it and the curved pit, showing the seat of the superior tooth, is convex and smooth, the striæ not extending over it. This character, as well as the form of the parietal and other teeth, is shown in Plate IX. fig. 27, 28.

This species has, in common with *fatigiata* Say and *Troostiana* Lea, a thin, brown, but more sparingly hirsute epidermis. I have noticed the tubercle within the last whorl, near the aperture, in *fatigiata* and *Troostiana*, but no such process exists in the species now under consideration. In *H. Hazardi*, the inferior tooth of the labrum, at its inner end, is continued back within the aperture, forming a white erect lamella on the floor of the whorl, parallel with, and leaving a narrow sinus between it and the inner wall, to which it is joined at its extremity, about 2½ mill. from the edge of the peristome. The position of this lamella can be seen through the shell.

In my remarks on *H. fatigiata* I have referred to the character of the parietal tooth in this species.

The size of my specimens is constant, viz., Diam., maj. 7, min. 6, alt. 3 mill.

In the Cabinet of the Academy at Philadelphia there are three specimens (dead shells), labelled *H. plicata* Say, and with memorandum on the label that they were deposited by Say. The habitat given is Kentucky. These specimens agree entirely with Bishop Elliott's, from one of which my figures were taken.

For the beautiful specimens in my cabinet, I am indebted to Bishop Elliott, who collected them in Murray Co., Georgia, and Soquatchee Valley, Tenn. He has recently sent me also, "the only one found in a pretty extensive search in the Cumberland Mountains, Tennessee."

Helix Dorfeuilliana Lea.

Plate IX. Fig. 24–26.

Polygyra *Dorfeuilliana Lea* Trans. Amer. Phil. Soc. VI. p. 107, pl. xxiv. fig. 118. 1838.
Helix *fatigiata Binn.* Bost. Jl. III. p. 388 ex parte. (excl. Syn. et fig.) 1840.
—— " " Terr. Moll. II. p. 193 ex parte. (excl. Syn. et fig.) 1851.
(non Pfr.—Desh. in Fer. Hist.—Chemn.—Reeve.)

The following is a copy of Mr. Lea's description,—his figures are copied on Plate IX. fig. 24, 25.

This species has, like *P. fatigiata* Say and *P. plicata* Say, one large tooth on the left lip, and two smaller ones on the right lip. It differs from the first in not being carinate, from the last in being larger, and having larger striæ. In the *Dorfeuilliana* the tooth on the left lip is large and square, with an indentation in the centre. The view into the mouth is nearly obstructed by the teeth, leaving, to appearance, three nearly square apertures. The superior part of the shell is striate, while the inferior part is nearly smooth, and exhibits two volutions. I have seen but a single specimen, which, I believe, is the only one obtained by Mr. Dorfeuille, who obligingly sent it to me."

I have already mentioned that Binney, both in the Boston Jl. and Terr. Moll., treats this species as identical with *fatigiata* Say, *plicata* Say, and *Troostiana* Lea, and that Deshayes confounds it with the two former.

Lea's *Dorfeuilliana* is certainly not described in Pfeiffer, Chemnitz (ed. 2), or Reeve, nor is there any figure of it in the two latter works. In all of them Honduras is erroneously given as one of the habitats, and I believe that they describe and figure the Honduras species, referred to by Shuttleworth (Diag. N. Moll. p. 16), in the following terms:—

"HELIX DYSONI.

"T. late et subperspective umbilicata, depressa, nitida, rufo-cornea, superne brevissime conoidea, plicato-striata, subtus inflata, striis exilioribus subobsoletis, lineisque paucis interruptis spiralibus circa umbilicum impressis obscure notata; anfr. 5½, convexiusculi, lente accrescentes, ultimus vix descendens, angulatus; sutura profunda; apertura majuscula, auriformis, tridentata: dente 1, valido, obliquo, pliciformi, in pariete aperturali intrante; perist. reflexum, album, dentibus 2 marginalibus intus munitum.

"*Syn. Helix Dorfeuilliana* Pfr. l. c. p. 410, No. 1067, non Lea, et excl. fig. Fer.
—— " " Chemn. ed. 2, t. 65, fig. 25–28.

"*Hab.*—In Honduras (Dyson).

"*Obs.*—Spec. 6 vidi. Species nullo modo cum H. Dorfeuilliana Lea confundenda, quæ, ultimo anfractu subtus devio umbilicum tantum spurium et rimalem ostendente, revera solummodo perforata est. Differt insuper H. Dorfeuilliana Lea, dente parietali magno, fere tetragono, linguiformi, peristomatis margina jungendo. H. Dorfeuilliana Lea (ad specimen unicum descripta) vix nisi H. Troostiana Lea varietas. H. Dysoni H. fallaci et Hopetonensi proxime affinis videtur."

Shuttleworth gives no measurements.

In January, 1856, Mr. Shuttleworth wrote to me, acknowledging receipt of some shells sent to him for examination, and which I had not then determined.

As to one, agreeing with my figure 26 on Pl. ix., he said, "this is *H. Dorfeuilliana* Lea, which I had never seen, but I find Albers has it unnamed from Texas, and I was on the point of describing it as a new species, so little does Lea's figure agree." The shell referred to may be a variety of Lea's species, to which certainly it is allied; it is distinct, however, from *fatigiata*, *Troostiana*, and *Hazardi*.

With respect to another shell, the same as my figure 25 *a*, former figure in his Synonymy of *H. Dysoni*. Reeve, in explanation of his figure, says,—"the specimen here figured has no teeth on the inner wall of the aperture, it being as commonly absent as present." I have examined many specimens of Lea's shell, and have seen none without the parietal tooth.

Pfeiffer also refers, but with doubt, to the figure in Fer. Hist. t. 69 D. fig. 3, which is, as I have shown, *H. fatigiata* Say, and in Mon. III. p. 264, he increases the confusion by adding *H. finitima* Desh. (*plicata* Say) to the Synonymy of *Dorfeuilliana* Lea.

It may be noticed that Honduras, and the habitats in the United States of Lea's species, are in distinct zoological provinces,—I do not know any species of *Helix* common to both.

H. Dorfeuilliana Lea differs materially in its characters from the three preceding species; the striæ on the upper surface are not so well defined as in *Troostiana*, but more so than in *Hazardi*, while the base is more smooth than in either of them, having only very delicate striæ, with microscopic impressed spiral lines.

The parietal tooth is quadrate,—the two teeth on the right lip are more nearly of the same size and form than in *fatigiata* and *Troostiana*. In this species the inferior tooth is transverse, and in some specimens broader than the superior one, but has a somewhat pointed apex,—both are very nearly equally deeply seated, but so far apart as to allow a view between them into the aperture, leaving, as Mr. Lea expresses it, "to appearance three nearly square apertures." Say would have described the two teeth as "separated by a remarkable sinus." The peristome of this is more thickened and less reflected than in the other species,—behind it is deeply constricted, without any appearance of pits showing the position of the teeth within.

H. Dorfeuilliana Lea varies in size,—the following are the measurements of my largest and smallest specimens:—

Diam. maj. 8, min. 7, alt. 3½ mill.
"   "   6½ " 5½ " 3   "

With respect to the shell considered by Shuttleworth to be *H. Dorfeuilliana*, it will be seen from the figure (Pl. ix. fig. 26), which differs, as he says, from Lea's, that the superior tooth on the labrum is larger and more deeply seated than the inferior one, and that the latter, though more developed, is much of the same form as the inferior tooth in *fatigiata* and *Troostiana*. The parietal tooth partakes of the general character of that in Lea's type of *Dorfeuilliana*, but its lower and terminal margins project more perpendicularly from the parietal wall. The umbilical perforation is also larger, and the base of the shell is more smooth.

The following are the measurements of a large specimen:—

Diam. maj. 9, min. 8, alt. 4.

I am much inclined to consider this a distinct species, but remark upon it, as I believe it is more commonly found in cabinets under the name of *Dorfeuilliana*, than the shell figure (Plate ix. fig. 33), and also Reeve's figure (same plate, fig. 34), which fairly represents the species.

H. Texasiana, in the form of the aperture and teeth, is nearly allied to *H. Hindsi* Pfr., and certainly more to *H. ventrosula* Pfr. than to *H. fatigiata* Say, or *Hazardi* Nob. (*plicata* Say).

The figures in Chem. (ed. 2, t. 10, fig. 11–12) said to be of *H. Texasiana*, and to which Shuttleworth refers in his observations on *H. fatigiata* (see ante, p. 286), appear to represent an undescribed species from Louisiana, of which I have specimens from the cabinet of Dr. Binney, and also from Mr. Isaac Lea.

In my cabinet there are numerous specimens of *H. Texasiana* Mor. from Texas and Mexico,—received from Judge Tappan, Dr. Newcomb, and Mr. W. G. Binney. One from Tamaulipas has the rufous band on the periphery, agreeing with Pfeiffer's Var. γ.

Helix Pennsylvanica Green.

SYNONYMY.

Helix	*Pennsylvanicus Green*	Cont. to Macl. Lyc. N. 1, p. 8.	1827.
——	*Pennsylvanica Binn.*	Bost. Jl. I. p. 483, pl. 16.	1837.
——	"	*De Kay*, N. Y. Moll. p. 41, pl. 3, fig. 45.	1843.
——	"	*Pfr.* Mon. Hel. I. No. 759, ex parte.	1848.
——	"	*Chemn.* ed. 2 Helix No. 442, ex parte, t. 73, fig. 4–5.	
——	*Mitchelliana Desh.*	in Fer. Hist. p. 137. ex parte. t. 97, fig. 4–7. nec. 13–16.	
——	*Pennsylvanica Binn.*	Ter. Moll. II. p. 105. Pl. VII.	1851.
——	"	*Rv.* Conch. Icon. No. 676 ex parte, Pl. CXVII. fig. 676.	1852.

Green's description is not readily met with, even in the United States, and I subjoin a copy of it:—

"H. PENNSYLVANICUS.

Shell subglobose; spire elevated; whorls 6 or 7, with numerous oblique wrinkles or striæ; suture deeply impressed; epidermis smooth, and of an olive-brown color, like most of the American Helices; umbilicus closed, or masked; aperture slightly contracted at the base,—a small callosity on the inner margin of the other lip near its lower angle. Shell rather more than half an inch in diameter.

This shell somewhat resembles the *H. clausa* of Mr. Say, but may very readily be distinguished from that species by the closed umbilicus, the number of its whorls, and its general form. This shell is not uncommon in the moist ground near Chartier's Creek, in Washington Co., Pa. I obtained five or six specimens with but very little trouble at that locality, associated with the *H. solitaria*, *profunda*, and *palliata*.

Authentic specimens are in the Cabinet of the Academy at Philadelphia.

This species has not been accurately determined by European authors, who have confounded it with *H. clausa* Say and *H. Mitchelliana* Lea, from which, however, it is entirely distinct. Green's description, to be found only in a scarce work, has probably been unknown, but the shell was correctly described and figured by Binney in the Boston Journal.

Pfeiffer, nevertheless, has *H. clausa* in the Synonymy of *H. Pennsylvanica*, and refers to Say's figure of the former, as well as to Binney's of the latter.

Deshayes, in Fer. Hist., describes *H. Mitchelliana*, but refers the figure, which is rather of *Pennsylvanica*.

The species under consideration may be readily distinguished ›m *clausa* and *Mitchelliana* by its somewhat triangular aper- re, which is more like that of *H. elevata* Say; it is more ele- ıted, has usually 6 whorls, more convex, and with deeper ture than in *H. clausa.* In mature shells the inner margin the peristome, near the columella, has a tooth-like callus, ry similar to that often prevailing in forms of *H. zaleta* Say, *yroidus* Say, and *albolabris* Say. The umbilicus is invariably ore or less open in *H. clausa*, but closed in *H. Pennsylvanica* ıd *Mitchelliana.*

This shell varies in size. The following are the dimensions the largest and smallest specimens in my Cabinet:

Diam. maj. 19, min. 16½, alt. 11, mill.
" " 16, " 14½, " 9, "

The distribution of this species is far more limited than that *H. clausa.* I have seen specimens only from Pennsylvania, hio, and Illinois; but of *clausa* from Ohio, Kentucky, Ten- ssee, Alabama, Illinois, Iowa, and Missouri.

The mention of this and other species by De Kay in the New ork Fauna, because of the probability of their discovery in at State, is calculated to mislead.

HELIX ELLIOTTI REDFIELD.

This species was described by Mr. John H. Redfield, in Annals Lyceum Vol. VI., p. 170. Figures are now given on Pl. IX., s. 8–10.

List of Figures on Plate IX.

1–3. Cypræa notata Gill. Ann. Lyc. Vol. VI. p. 256.
4–5. Helix barbigera Redf. nat. size. " " " p. 171.
6. " " " upper surface, double nat. size.
7. " " " part of same magnified four times.
8–10. " Elliotti " nat. size " " " p. 170.
11–13. " sculptilis Bland. " " " " p. 279.
14–16. " Edvardsi " " " " " p. 277.
17. " fatigiata Say (Dorfeuilliana Desh.), copied from Fer. Hist. Pl. 69 D. fig. 3. " " p. 283.
18. " " " aperture mag. four times.
19–20. " " " copied from Binney Ter. Moll. III. pl. xxix. fig. 4.
21–22. " Troostiana Lea, copied from Trans. Amer. Phil. Soc. VI. Pl. xxiv. fig. 119. " " p. 288.
23. " " " aperture mag. four times.
24–25. " Dorfeuilliana Lea, copied from Trans. Amer. Phil. Soc. VI. Pl. xxiv. fig. 118. " " p. 294.
25 *a*. " " " aperture mag. four times.
26. " " ? var.? " " "

XXVI.—*Synopsis of the Genus* ACHATINELLA.

V. NEWCOMB, M.D., of Albany, N. Y., Corresponding Member.

Read September 6th, 1858.

Proceedings of the Zoological Society of London, of
.845, Dr. L. Pfeiffer gave a list of eighteen species of
la, as then known to the scientific world.

Proceedings of the Boston Natural History Society,
months anterior to this date, Dr. Mighels described
pecies, and Dr. Gould added four additional ones; but
ımber several are included under different names in
'er's Monograph.

0, Mr. Reeve gave ten or more new species in his
ɔh, to which we must add several species described by
l, and Professor C. B. Adams, swelling the numbers
this date to about fifty.

his point more laborers entered the field of discovery,
ew forms since described have increased the known
more than one hundred and eighty. As several par-
engaged at the same time in these labors, it is not at
ising that many species were repeatedly described
fferent names, which has led to much confusion in
ıngement. To obviate this difficulty, I have at the
n of many friends consented to supply a synopsis of
s, as it now stands; and have given, in addition, de-
of many of the animals, to aid in a correct diagnosis
s.

dence of several years upon the Sandwich Islands,
reful study of this branch of natural history during a
nine years; an opportunity for examining the origi-
of Ferussac, Swainson, Gray, Reeve, and Pfeiffer, in
t collections of Europe, together with the privilege
'orded me by Mr. Gulick, of critically examining all

his typical specimens, enable me to express my opinions with some degree of confidence.

I apprehend, however, that my labors are not entirely without errors, which to some may appear inexcusable. We are aware that "gentlemen will differ" as to what constitutes a species, some judging that a slight variation in color or form will warrant a separation, which by others will be classed as only a variety.

There is one position that will not admit of a question, and that is, that all the young from a common parent, however variable, must be considered as *one* species. To a limited extent my opportunities for applying this test in practice have been improved, and the results have influenced my opinions as expressed in the following paper.

It may be well to refer to several sources of error, which should be carefully guarded against in an examination of the shells of this genus.

The arid districts upon the Sandwich Islands are often in close proximity to those abundantly supplied with rain,—the latter furnish the most favorable condition for the full growth and development of molluscous animals.

what from the typical forms, which has led to the multiplication of species by this exhibition of their artistic skill.

The variation in the different stages of growth of the same species has been a fruitful source of error, and encumbered our table of synonyms with a large list of names.

On the other hand, our best conchologists have been led into error by a simple examination of the shell alone, and grouped as varieties, species, of which the animals, in their appearance, form, and habits, are widely separated. As far as practicable, I have endeavored to make suitable corrections.

To the various collectors, scientific and amateur, I am under many obligations, and take this opportunity of acknowledging favors received from Rev. Mr. Johnson, Rev. Mr. Dwight, Messrs. Pease, Gulick, Remy, Garratt, Frick, and many others.

NOTE.—My descriptions of *Achatinellæ* are in the Annals of the Lyceum of Nat. Hist. N. Y., vol. vi., Proc. Zool. Soc. Lond. 1853, and Proc. Boston Soc. Nat. Hist. 1855.

1. **A. textilis Fer.** Voy. de Freyc. p. 482.
" *ventulus Reeve, non Fer.* Monograph, No. 31.
" *microstoma Gould.* Proc. N. H. Soc., Bost. 1845, p. 28.
" *ventulus Pfr.* Mon. Hel. Viv. ii. p. 241.

Hab. Oahu.

Ferussac's types of this genus, so far as preserved, are in the collection of the "Jardin des Plantes," at Paris. My thanks are due to the gentlemanly Savans who have the Conchological department in their charge, for extending to me every facility in searching for, and examining critically the desired species. But for an absolute certainty, I would not venture to change the well established position in nearly all European and American collections of this, and the following species. I am happy to have the testimony of Dr. Gould of Boston, of M. Kiener, and others, to vouch for the correctness of my opinion.

2. **A. ventulus Fer.** Prod. No. 437.
" *melampoides Pfr.* Zool. Proc. 1851.

Animal intensely black; superior tentacles rather long; bottom of foot and mantle very light grey; motions quite lively.

Hab. Oahu.

This shell in the Imperial Museum is a dead and worn specimen, but its identity with *melampoides* could not be mistaken.

3. **A. vulpina Fer.** Hist. Moll. pl. 155, fig. 1.
" *Stewarti Green.* Reeve Mon. fig. 26.
" *diversa Gulick* (*part.*)* Ann. Lyc. N. Hist. N. Y. VI. fig. 42.
" *varia Gul.* " " " " " " 43.
" *analoga Gul.* (*immature.*) " " " " " " 47.
" *virens Gul.* " " " " " " 73.
" *livida Pfr. non Swains.* Mon. III. p. 464.

This is one of the most common shells met with on Oahu,

4. **A. gravida Fer.** Desh. in Fer. Hist. II. p. 238.
" *suffusa Reeve.* Mon. fig. 11.
" *Dimondi, C. B. Adams.* Contrib. to Conchol. p. 126.

Animal of a light slate color above, thickly studded with black tipped granulations; tentacles black; moderately clubbed; foot as long as the shell; mantle dark chocolate; slightly margined with white.

The *suffusa* Reeve is a roseate variety with the epidermis removed. This occasionally occurs while the animal still inhabits the shell.

In the Imperial Museum the original type of Ferussac is preserved, with a specimen of *A. straminea* Reeve as a variety, on the same tablet.

5. **A. spirizona Fer.** Hist. Moll. pl. 155, fig. 14.
" *acuta Swains.* Zool. Illus. pl. 99, fig. 3.

Animal when in motion longer than the shell; thickly studded with very black granulations, with the interstices of a light slate; mantle of a yellowish white.

6. **A. turritella Fer.** Hist. Moll. pl. 155, fig. 13.
" *Oahuensis Green.* Mac. Lyc. 1827.
" *inornata Mighels.* Boston Proc. 1845.

Animal short, only half as long as the shell; of a dark slate color on the sides; superior portion and tentacles black; under surface of foot light grey; mantle dark brown.

7. **A. decora Fer.** Hist. Moll. pl. 155, fig. 5.
" *vestita Mighels.* Boston Proc. 1845.
" *perversa Pfr. non Swains.* Mon. III. p. 465.
" *simulans Pfr. non Reeve.* " "
" *lugubris var. Pfr. non Reeve.* " "
" *vittata Pfr. non Reeve.* " "

Animal longer than the shell; of a light gamboge yellow, with slate colored tentacles and tentacular sheath, posteriorly and superiorly slightly sprinkled with slate; mantle of a bluish yellow.

Dr. Pfeiffer has placed *perversa* Swains., *simulans* Reeve, *vittata* Reeve, and the variety of *lugubris* Chem. figured in Reeve's Mon., as synonyms of this species. Without an acquaintance with the animals or with their local distribution, it is not surprising that he should thus group them together.

In Mal. Blat., of June, 1854, Dr. Pfeiffer very properly restores *A. simulans* to the rank of a species; and we find it necessary to extend the same courtesy to *perversa* and *vittata*.

8. **A. tristis Fer.** Pro. No. 435.
   " *fuliginosa Gould.* Proc. Boston Soc. 1845, p. 28.

9. **A. lugubris Chem.** Chem. fig. 2059–60.
   " *pica Swains.* Zool. Ill. pl. 99, fig 1.
   Monodonta seminigra Lam. Vol. VII., p. 37.
   Bulimus seminiger Menke. Syn. p. 26.

Mr. Reeve gives a shell from a different group for the true *pulcherrima* Swain., and follows Dr. Pfeiffer in giving *A. Byronii* Gray as a synonym. As it happens, the *A. Byronii* preserved in the British Museum is distinct from both the shells referred to, but proves to be identical with *A. melanostoma* Newc.

My friend Mr. Gulick is peculiarly unfortunate in tracing out his synonyms in Ann. Lyc. vi. p. 244. The original of Swainson's shell is in the magnificent collection of Mr. Cuming.

11. **A. perversa Swains.** Zool. Ill. pl. 99, fig. 2.
" *concidens Gul.* Ann. Lyc. l. c. fig. 54. *An immature dead shell.*
" *cinnamomea Pfr. var.* Zool. Proc. 1858, p. 22.

Animal long as the shell; light grey color, tentacles and sheath light brown with a bar of brown across the front, upper tentacles alone clavate, strongly swelling at their base; granulations large.

There are several varieties of this species, one of which has so near an approach to *A. decora*, as to lead to their being confounded with each other. They are, however, widely separated in locality, and the animals are even more distinct in markings and habit than the shells themselves.

12. **A. rosea Swains.** Zool. Ill. pl. 123, fig. 1.

Animal, when young, of a bright straw yellow, with ocular appendages tinged with brown.

In the adult, the color is a uniform light grey, with mantle and tentacles dark brown.

13. **A. livida Swains.** Zool. Ill. pl. 108, fig. 2.
" *viridans Reeve non Mighels.* Mon. No. 25.
" *Reevei C. B. Adams.* Contributions, p. 128.
" *Emersonii Newc.* Zool. Proc. fig. 74. 1853.
" *glauca Gul.* Ann. Lyc. l. c. fig. 51.

I am sorry to be obliged to place so many synonyms under this species. The very short description and unsatisfactory figure given by Swainson, have doubtless contributed to this result. A complete series to connect the extremes of these varieties will demonstrate the necessity of making at least a dozen *more* species, or to include them all under one. Mr. Gulick is mistaken in supposing that the variety figured by Mr. Reeve is not found on the Island of Oahu.

This and all the other varieties are met with in the District of Waialua, and it is an interesting fact, that *all* the species described by Mr. Swainson are from the same district.

14. **A. bulimoides Swains.** Zool. Ill. pl. 108, fig. 1.
" *obliqua Gul.* Ann. Lyc. l. c. fig. 63.
" *oomorpha do.* (*type*). Ann. Lyc. l. c. fig. 64.
" *bulimoides Reeve.* Mon. pl. 1. fig. 8.

The type of *A. oomorpha* Gul. is this species; but specimens furnished to Mr. Cuming of London under that name are the true *glabra* Newc. The beautiful reversed variety called by variety of *A. ovata* Newc. His figures of *pallida*, however, give this species correctly.

16. **A. marmorata Gould**. Proc. Boston Soc. 1848.
  " *Adamsi Newc.* Ann. Lyc. l. c. p. 19.
  " *Adamsii Newc.* Zool. Proc. 1853, fig. 20.
  " *perdix Pfr. non Reeve.* Mal. Blat. June, 1854, p. 116.
  " *induta Gul.* Ann. Lyc. N. Y. l. c. fig. 34.
  " *plumbea Gul.* " " " " fig. 39.
  " *ustulata Gul. (reversed).* " " fig. 37.

Animal light pea green, strongly granulated, one third longer than the shell, tentacles light slate; mantle and base of foot same color as the body.

Dr. Pfeiffer allows *marmorata* Gould, but places *Adamsii* Newc. as a synonym of *A. perdix* Reeve.

I have clearly established the identity of my shell with that of Dr. Gould, and do not doubt the specific difference of *marmorata* and *perdix*. As Mr. Reeve's description dates 1850, those who do not concur in this opinion must place *A. perdix* as a synonym of *A. marmorata*.

17. **A. picta Mighels**. Proc. Boston Soc. Jan. 1845.
  " *bulbosa Gul.* Ann. Lyc. N. Y. l. c. fig. 71.
  " *picta Pfr.* Zool. Proc. Aug. 1845.

Animal densely black, surface chequered by fine lines of a light color; tentacles slate, much produced; mantle and bottom of foot brownish black.

When extended, same length as the shell.

18. **A. venusta Mighels**. Proc. Boston Soc. Jan. 1848.

Animal slender, body flesh color with black puncta down the sides; tentacles very black, superior ones long, inferior ones very short.

When extended, two thirds as long as the shell.

19. **A. citrina Mighels**. Reeve's Mon. fig. 33.

Animal of a uniform light yellow color, superior tentacles and tentacular sheath light slate.

20. **A. plicata Mighels**. Proc. Bost. Soc. January, 1848.
Bulimus liratus Pfr. Zool. Proc. 1851.

Animal rather shorter than the shell; tentacles at their origin closely approximating, short and strongly clubbed; bottom of foot, mantle, and posterior part light grey, anteriorly mottled with fine bluish dots.

Motions at first sluggish and timid, but soon becoming bold, rapid, and gliding.

21. **A. nubilosa Mighels**. Proc. Bost. Soc. January, 1848.

Animal tessellated black and grey (when in motion), tentacles deep black, bottom of foot and mantle dark brown.

Animal light grey; tentacles and tentacular sheath dark slate; mantle thick, yellowish brown; tentacles strongly clubbed, short, and robust, when extended, longer than the shell.

Dr. Pfeiffer places my *rutila*, *subvirens*, and *decipiens*, as varieties of this species. The two former are nearly allied to *viridans*, but the latter is so widely separated as to have furnished four or more *species* from its varieties, subsequently to my descriptions. This would indicate that the views of their authors are in conflict with this eminent naturalist.

24. **A. mustelina Mighels.** Proc. Bost. Soc. 1845, p. 21.
" *lorata var. β. Pfr.* Mon. II. p. 236.

Animal of a grass green, through different shades more or less intense; tentacles light slate.

A very curious variety of this shell is met with, in form resembling *A. decora*. It is polished, of a roseate, ashy hue above, and the inferior half of the last whorl deep brown or black. The animal is, however, identical with *A. mustelina*, and it is met with in the mountains of Waianae, on the island of Oahu, the central region for *mustelina*.

25✓**A. cingula Mighels.** Proc. Bost. Soc. 1845.

It is possible that this name should cover *A. vitrea* Newc., but the shell in the Mus. Cuming is quite a different species from *vitrea*, and for the present I prefer to hold the latter as a distinct species.

26. **A. radiata Gould.** Proc. Bost. Soc. Jan. 1845, p. 27.
" *dubia Pfr. non Newc.* Mal. Blat. 1854, p. 116.
" *grisea Pfr. non Newc.* " " " " 117.
Partula radiata Pfr. Mon. III. p. 454.
Bulimus Gouldi Pfr. Mon. II. p. 74.
Partula densilineata Reeve. Mon. pl. 2, fig. 9.

By the above it will be seen that Dr. Pfeiffer places *A. dubia* Newc., and *A. grisea* Newc., as varieties of *A. radiata* Gould. An examination of a large number of specimens of each species confirms me in the opinion that they are quite distinct from each other. The lineations characteristic of *A. radiata* Gould, are wanting on *A. dubia*, which has a more highly polished surface, covered with a pattern of fine undulations. *A. radiata* I have never obtained heterostrophe. *A. dubia* is frequently, and *A. grisea* always left-handed.

Dr. Pfeiffer erroneously quotes for this last, "Waianae, Oahu" as the locality. It is confined to East Maui, so far as I can ascertain.

There are differences in the form of these species, when fully matured, which are much more striking than in the ordinary cabinet specimens.

27. **A. rubens Gould.** Proc. Bost. Soc. 1846, p. 27.
" " *Reeve.* Mon. fig. 42 *b.*
" *Mastersii Pfr. non Newc.* Mal. Blat. 1854, p. 129.

29. **A. striatula Gould.** Proc. Bost. Soc. Jan. 1845, p. 28.
" *clara Pfr.* Zool. Proc. Aug. 26, 1845.
" *clara Reeve.* Mon. pl. 6, fig. 5.

Hab.—Kauai.

30. **A. cerealis Gould.** Proc. Bost. Soc. 1848, p. 201.

31. **A. acuminata Gould.** Proc. Bost. Soc. 1848, p. 200.

32. **A. guttula Gould.** Proc. Bost. Soc. 1848, p. 201.
" *gummea Gul.* Ann. Lyc. l. c. fig. 10.
" *fragilis Gul.* " " fig. 11.

These small shells have been transferred from island to island probably on plants.

33. **A. vittata Reeve.** Mon. Sp. 9. (Mus Cuming.)
" *decora var. Pfr. non Fer.* Mon. iii. p. 465.
" *globosa Pfr.* Zool. Proc. 1845, fig. 25.

This species is met with in Nuuanu Valley, some three miles from Honolulu. The inflated variety designated as *A. globosa* by Dr. Pfeiffer, is not uncommon. The typical specimen of this species in the Cumingian collection is more elongated than is common, but is entirely satisfactory in establishing in my mind the claims of the species.

34. **A. producta Reeve.** Mon. pl. 2, fig. 13.
" *venulata Newc.* Zool. Proc. 1853, fig. 48 *a.*
" *hybrida Newc.* " " " " 52.
" *vulpina Gul. non Fer.* Ann. Lyc. l. c. p. 244.

Mr. Gulick is quite correct in placing *A. hybrida* and *venulata* as synonyms of this species. The artistic skill of the "late

Consul-General of France," as displayed upon these shells, proved quite sufficient to deceive their describer, and lead to a wrong "diagnosis."

The animal is strongly granulated above; when young, of a pale flesh, when adult, of a slate color, with the tentacular sheaths of a dark slate.

35. **A. simulans Reeve.** Mon. pl. 2, fig. 15.
" *decora Pfr. non Fer.* Mon. III. p. 465.

The large number of this species collected in the valley of Nieu, without any admixture of the typical *decora*, establishes the correctness of Mr. Reeve in giving it a distinct place as a good species. Dr. Pfeiffer in Malak. Blatt., June 1854, p. 125, admits it as such.

36. **A. bella Reeve.** Mon. pl. 3, fig. 17.

Animal of a uniform yellowish white, with slate colored tentacles.

A critical examination of Swainson's description and figure atisfied me that Mr. Reeve had given a wrong shell for that pecies, and an examination of the type in Mus. Cuming confirmed me in this opinion. *A. bilineata* Reeve comes next in order, and although not strictly characteristic, the name should be retained.

39. **A. abbreviata Reeve.** Mon. pl. 3, fig. 19.
" *nivosa Newc.* "Manufactured," Zool. Proc. pl. 12, fig. 6. 1853.
" *Clementina Pfr.* Zool. Proc. 1855, p. 205.

Animal, light grey, covered above with numerous granulaions of a dark slate; mantle, a dirty yellow; tentacles but slightly clubbed; when extended, nearly as long as the shell.

A. Clementina Pfr. is in Mus. Cuming, a short but old *A. abbreviata.*

A. nivosa is a fully developed shell, with the epidermis removed so skilfully as to escape detection at the time it was described.

40. **A. castanea Reeve.** Mon. pl. 3, fig. 24.

41. **A. olivacea Reeve.** Mon. pl. 3, fig. 20.
" *prasinus Reeve.* Mon. pl. 4, fig. 27.

42. **A. adusta Reeve.** Mon. pl. 4, fig. 30.

43. **A. perdix Reeve.** Mon. pl. 6, fig. 43.
" *pyramidalis Gul.* Ann. Lyc. l. c. pl. 7, fig. 32.
" *undosa Gul.* " " " pl. 7, fig. 33.

Animal, bluish white; upper tentacles and sheath slate colored; basal margin of foot bordered with light slate; bottom of foot and mantle greenish white; when extended, not longer than the shell.

Few species of the genus pass through a greater variety of changes than this, in form and markings. My collection numbers over twenty, which may fairly be classed as varieties. Of many of them I have examined the animals, and find no difference in color, or so slight as to call for no special notice.

The ventricose light-colored or clouded reversed varieties are perhaps, in the appearance of the shell, farther removed from the type than those given here as synonyms.

44. **A. bacca Reeve.** Mon. pl. 6, fig. 45.

Animal of a greenish slate above, tentacles and sheaths dark brown, mantle, yellowish green; length, when extended, equal to the shell.

45. **A. straminea Reeve.** Mon. pl. 5, fig. 38.

" *gravida var. Fer.* In Imperial Museum, Paris.

Animal of a uniform light flesh-color, oral aperture margined

47. **A. ellipsoidea Gould.** Proc. Bost. Soc. 1848, p. 200.
" *pupoidea Newc.* Zool. Proc. 1853, pl. 23, fig. 42.

There is little doubt, from the descriptions, of the identity of these species; of course the priority belongs to Dr. Gould.

48. **A. magna C. B. Adams.** Contr. to Conch. page 125.
" *Baldwinii Newc.* Zool. Proc. pl. 24, fig. 72. 1853.

Animal of inky black above, veined with white; when extended, as long as the shell; base of foot and mantle of a bluish grey.

49. **A. modesta C. B. Adams.** Contr. to Conch. p. 128.

50. **A. Tappaniana C. B. Adams.** Contr. to Conch. p. 126.
" *eburnea Gul.* Ann. Lyc. l. c. p. 199, fig. 28 *a.*—28 *b.*
" *ampulla Gul.* " " " p. 200, " 29.
" *fasciata Gul.* " " " p. 201, " 30.

Mr. Gulick has taken three varieties, describing them as distinct species. All these varieties have been subjected to the critical eyes of Mr. Cuming and of Dr. Pfeiffer, who agree with me in this arrangement. It is due to Mr. Gulick, however, to remark that the differences in the extremes of these varieties are as great as have laid the foundation for many of the species universally received by naturalists.

51. **A. Mighelsiana Pfr.** Zool. Proc. 1847, p. 231.

Animal uniform bluish-white, tentacles slate.

52. **A. pyramis Pfr.** Zool. Proc. 1845, p. 90.
" *leucochila Gul.* (*dwarf*), Ann. Lyc. l. c. p. 173, fig. 1.

53. **A. taeniolata Pfr.** Zool. Proc. 1846, p. 38.
" *rubiginosa Newc.* Zool. Proc. 1853, fig. 69.

I defer to the opinion of Dr. Pfeiffer in placing *A. rubi* *nosa* as a synonym of his *A. taeniolata.*

The form of the shells is nearly identical, and although fering in marking, the principal ground of separation origin was a difference in the animals. The dark chestnut shell is nished with a light, and even the immaculate variety of *tae* *lata,* with a brown-colored mantle.

54. **A. variegata Pfr.** Zeitschr. 1849, p. 90.
" *rubens var. Reeve.* Mon. pl. 6, fig. 42 *a.*
" *decepta C. B. Adams.* Contr. to Conch., p. 127.

55. **A. corneola Pfr.** Zool. Proc. 1845, p. 90.

56. **A. aptycha Pfr.** Zool. Proc. 1855, fig. 1.

57. **A. pulchella Pfr.** Zool. Proc. 1855, fig. 2.

and rendered distinct from *A. spirinoza Fer.*, under which name I have furnished it to correspondents, but always with some "mental reservation."

64. **A. fusiformis Pfr.** Zool. Proc. 1855, pl. 30, fig. 18.

65. **A. gracilis Pfr.** " " " " " " 22.
" *elevata Newc.* Zool. Proc. 1855, p. 209.
" *subula Gul.* Ann. Lyc. l. c. pl. 6, fig. 19.

In Mr. Cuming's collection this shell has the name of *A. elevata* Newc., and the name *gracilis* Pfr. is attached to a variety of *A. striatula* Gould. From a careful examination of the descriptions, and the figure given by Dr. Pfeiffer, I do not doubt their identity, and have thus placed *elevata* as a synonym.

In the Proceedings of the Zoological Society for November, 1855, Dr. Pfeiffer described in my name several species which I had forwarded to Mr. Cuming. In July preceding *four* of these species were described by me in the Proceedings of the Natural History Society, Boston, on pages 218, 219, and 220, and in the month of September I gave seven additional ones in the Annals of the Lyceum. (Vol. vi. p. 142–147.) The names of the species that Dr. Pfeiffer so kindly gave me, besides those referred to, are, *A. Mauiensis*, *A. fulva*, *A. oviformis*, *A. pulla*, *A. elevata*, *A. obtusa*, and *A. apicata*.

66. **A. crassidentata Pfr.** Zool. Proc. 1855, pl. 30, fig. 23.

This species should be doubtfully received. The original in Mus. Cuming is but a variety of *A. vulpina* Fer., denuded of epidermis.

67. **A. nobilis Pfr.** Zool. Proc. 1855, p. 202.

68. **A. Hanleyana Pfr.** Zool. Proc. 1855, p. 202.

69. **A. zebrina Pfr.** " " " " "

70. **A. extincta Pfr.** Zool. Proc. 1855, p. 204.

71. **A. obclavata Pfr.** “ “ “ p. 98.
“ *octogyrata Gul.* Ann. Lyc. l. c. pl. 6, fig. 18.
“ *turrita Gul.* “ “ “ “ “ 20.

72. **A. luctuosa Pfr.** Zool. Proc. 1855, p. 204.

73. **A. Grayana Pfr.** “ “ “ “ “

74. **A. glutinosa Pfr.** “ “ “ “ “
“ *lacrima Gul.* Ann. Lyc. l. c. pl. 6, fig. 4.

75. **A. callosa Pfr.** Mus. Cuming.

76. **A. dimidiata Pfr.** Zool. Proc. 1855, p. 205.

77. **A. semicostata Pfr.** “ “ “ p. 206.
“ *costulata Gul.* Ann. Lyc. l. c. pl. 6, fig. 5.

78. **A. teres Pfr.** Zool. Proc. 1855, p. 206.

79. **A. oryza Pfr.** “ “ “ “
“ *triticea Gul.* Ann. Lyc. l. c. pl. 6, fig. 12.

83. **A. lurida Pfr.** Zool. Proc. 1855, p. 206.
Tornatellina castanea Pfr. Mon. III. p. 524.

84. **A. obeliscus Pfr.** Zool. Proc. 1855, p. 206.
Balea Newcombi Pfr. Mon. III. p. 583.

85. **A. amœna Pfr.** Zool. Proc. 1855, pl. 30, fig. 3.

86. **A. cerea Pfr.** " " " " " "21.

87. **A. Chamissoi Pfr.** " " " " p. 98.

88. **A. Newcombiana Pfr.** Mal. Blat. 1854, p. 119.
" *Pfeifferi Newc.* Ann. Lyc. l. c. p. 25.
" *Pfeifferi Newc.* Zool. Proc. 1853, pl. 24, fig. 58.
" *Bulimus Newcombianus Pfr.* Zool. Proc. 1851.

89. **A. Cumingi Newc.** Ann. Lyc. l. c. p. 25.
" " Zool. Proc. 1853, pl. 24, fig. 59.
" *gemma Pfr.* (*immature.*) " 1858, p. 22.

90. **A. farcimen Pfr.** Mus. Cuming.

91. **A. Dunkeri Cuming.** Zool. Proc. 1855, p. 208.

This has been separated from *A. producta* Reeve, from its constant characters of beautiful fine longitudinal lineations, cinctured often by one or more brown bands on the body whorl.

92. **A. Gouldi Newc.** Ann. Lyc. l. c. p. 21.
" *Gouldii Newc.* Zool. Proc. 1853, pl. 22, fig. 1.
" *talpina Gul. var.* Ann. Lyc. l. c. pl. 7, fig. 38.

93. **A. ovata Newc.** Ann. Lyc. l. c. p. 22.
" " " Zool. Proc. 1853, pl. 22, fig. 2—2*a*.
" *candida Pfr.* " " 1855, " 30, " 4. "
" *Fricki Pfr.* " " " " " " 7. "
" *vidua Pfr.* " " " " " " 10. "
" *cervina Gul. var.* Ann. Lyc. l. c. pl. 8, fig. 62.
" *rotunda Gul.* " " " " " 67.
" *spadicea Gul.* " " " " " 65.
" *pheozona? Gul.* (*immature.*) Ann. Lyc. l. c. pl. 7, fig. 40.
" *lorata Reeve non Fer.* Mon. pl. 1, fig. 6.

Animal of a uniform light blue, tentacles and sheath above lined with dark slate; mantle light slate, in the dark varieties of the shell of a deeper shade.

This shell passes through a great variety of forms and markings. My collection numbers, of well marked varieties, about forty. With this series I am able to connect (with one exception) all the varieties given as synonyms. The *A. vidua* Pfr., which I had supposed was my manuscript *A. Wheatleyi*, I find in Mus. Cuming to be a somewhat worn and faded specimen of

97. **A. Redfieldi Newc.** Ann. Lyc. l. c. p. 22.
" " " Zool. Proc. pl. 22, fig. 5. 1853.

Animal as long as the shell, greyish above, sprinkled slightly with brown, tentacles of same color, mantle slate, bottom of foot of a greenish grey.

98. **A. cestus Newc.** Zool. Proc. pl. 22, fig. 8. 1853.

99. **A. Swiftii Newc.** " " " " 9. "
" *valida Pfr. (var.)* " 1855, pl. 30, fig. 24.
" *apicata Newc.* " " " p. 210.

Animal of a bluish slate, deeper on the head and tentacles, and on the posterior part of the foot above; longer than the shell; bottom of foot greenish white, mantle black.

Unfortunately the type figured in the Zoological Proceedings is not the usual pattern of the shell, but is one of the more uncommon varieties.

100. **A. turgida Newc.** Zool. Proc. pl. 22, fig. 10. 1853.

101. **A. cylindrica Newc.** " " " 13. "
" *intermedia Pfr. non Newc.* Mal. Blat. 1854, p. 131.

Animal light grey, marbled with dusky triangular patches, mantle light grey, tentacles dark, granulations strong. A dorsal and two obscure lateral white lines extend from the head along the animal.

102. **A. intermedia Newc.** Zool. Proc. pl. 22, fig. 13. 1853.
" *rudis Pfr. (part,)* Zool. Proc. 1855, pl. 30, fig. 17.

103. **A. casta Newc.** Zool. Proc. pl. 22, fig. 12. 1853.
" *dimorpha Gul.* Ann. Lyc. l. c. pl. 8, fig. 56.
" *cognata Gul. var.* Ann. Lyc. l. c. pl. 8, fig. 60.
" *juncea Gul., dwarf.* Ann. Lyc. l. c. pl. 7, fig. 49.

104. **A. violacea Newc.** Ann. Lyc. l. c. p. 18.
" " " Zool. Proc. pl. 22, fig. 14. 1854.

105. **A. sanguinea Newc.** Zool. Proc. pl. 22, fig. 15. "
" *Ferussaci Pfr.* Zool. Proc. 1855, p. 203.

Animal as long as the shell, anterior superior portion a dark brown, with tentacles of same color, posteriorly cut up into squares and other geometrical figures by light-colored lines. Mantle light flesh color, bottom of foot light green.

The type of Dr. Pfeiffer's species is a large sized *A. sanguinea*, with the black markings carefully removed by design or accident. This specimen is in the magnificent museum of Mr. Cuming.

106. **A. porphyrea Newc.** Zool. Proc. pl. 22, fig. 16. 1853.
" *grossa Pfr.* Zool. Proc. p. 204. 1855.

107. **A. gigantea Newc.** Zool. Proc. pl. 22, fig. 17. "

108. **A. subvirens Newc.** Zool. Proc. pl. 22, fig. 18. "

110. **A. ampla Newc.** Zool. Proc. pl. 22, fig. 19. 1853.

111. **A. rugosa Newc.** Zool. Proc. pl. 22, fig. 22. "

112. **A. multilineata Newc.** Zool. Proc. pl. 22, fig. 23. "
" *monacha Pfr.* Zool. Proc. 1855, pl. 30, fig. 9.

113. **A. glabra Newc.** Zool. Proc. pl. 22, fig. 25. "
" *platystyla Gul., dead and worn.* Ann. Lyc. l. c. pl. 6, fig. 25.
" *elegans Pfr. non Newc.* Mal. Blat. 1854, page 121.

114. **A. elegans Newc.** Zool. Proc. pl. 24, fig. 57. 1853.

115. **A. tessellata Newc.** Ann. Lyc. l. c. p. 19.
" " Zool. Proc. pl. 23, fig. 26. "

Animal dark slate above, tentacles same color; strongly granulate, bottom of foot light olive; mantle black; as long as the shell; movements sluggish.

116. **A. sordida Newc.** Zool. Proc. pl. 23, fig. 27. 1853.
" *Swainsoni? Pfr.* Zool. Proc. 1855, pl. 30, fig. 13.
(see No. 60.)

117. **A. fumosa Newc.** Zool. Proc. pl. 23, fig. 28. "

118. **A. lineolata Newc.** Ann. Lyc. l. c. p. 29.
" " Zool. Proc. pl. 23, fig. 29. "

119. **A. nitida Newc.** Ann. Lyc. l. c. p. 29.
" " Zool. Proc. pl. 23, fig. 30. "
" *crystallina Gul.* Ann. Lyc. l. c. pl. 6, fig. 14.

120. **A. crassilabrum Newc.** Zool. Proc. pl. 23, fig. 31. "

121. **A. cornea Newc.** Zool. Proc. pl. 23, fig. 32. "

122. **A. labiata Newc.** Ann. Lyc. l. c. p. 27.
" " Zool. Proc. pl. 23, fig. 33. 1853.
" *dentata Pfr.* Zool. Proc. 1855, pl. 30, fig. 27.
" *lagena Gul.* Ann. Lyc. l. c. pl. 6, fig. 3, *variety.*

123. **A. vitrea Newc.** Zool. Proc. pl. 23, fig. 34. "
" *fumida Gul., dwarf.* Ann. Lyc. l. c. pl. 6, fig. 9.

124. **A. affinis Newc.** Zool. Proc. pl. 23, fig. 35. "
" *goniostoma Pfr.* Zool. Proc. 1855, p. 203. Mus. Cuming.

Two of the three specimens in Mus. Cuming labelled *A. goniostoma* Pfr. clearly belong to this species—a larger specimen may be distinct.

125. **A. elongata Newc.** Ann. Lyc. l. c. p. 26.
" *acuta Newc.* Zool. Proc. 1853, p. 16.

The two names for this species grew out of a change made by my friends in New York upon the publication of my paper, to avoid the repetition of a name used by Swainson.

127. **A. soror Newc.** Zool. Proc. pl. 23, fig. 38. 1853.

Hab. Maui, also Ranai.

128. **A. obesa Newc.** Ann. Lyc. l. c. p. 24.
" " " Zool. Proc. pl. 23, fig. 39. "

Entire animal of a sooty black; superior tentacles strongly clubbed, lower ones with a light-colored tip, granulations large; longer than the shell; motions very slow and timid.

129. **A. terebra Newc.** Zool. Proc. pl. 23, fig. 40. 1853.
" *attenuata Pfr.* " " pl. 30, fig. 12. 1855.
" *lignaria Gul. var.* Ann. Lyc. l. c. pl. 7, fig. 35.
" *crocea Gul.* " " " pl. 7, " 36.

From the figures referred to above, there would scarcely (in the last two named) arise a suspicion of identity. The specimens themselves have passed under my examination, and from an extensive suite of the varieties, I had no difficulty in at once recognising them as the extremes of this species.

130. **A. melanosis Newc.** Zool. Proc. pl. 23, fig. 41. 1853.

131. **A. curta Newc.** Zool. Proc. pl. 23, fig. 43. "
" *delta Gul.* Ann. Lyc. l. c. pl. 8, fig. 50.
" *albescens Gul.* " " " 8, " 57. *variety.*
" *contracta* " " " " 8, " 59.

The reversed specimens of this species undergo changes which have led to their being considered distinct species. I have, however, been unable to seize upon any permanent characters in any one of the varieties where a specific line can be safely drawn.

132. **A. fusca Newc.** Ann. Lyc. l. c. p. 28.
“ “ “ Zool. Proc. pl. 23, fig. 44. 1853.
“ *striatella Gul.* Ann. Lyc. l. c. pl. 6, fig. 6.
“ *petila* “ “ “ “ “ “ 17.

There may be some question whether *A. semicostata* Pfr. should not also be admitted as a synonym. The characters are, however, so well developed in that shell, that I believe it to be distinct from *A. fusca*, and not a mere variety.

133. **A. recta Newc.** Zool. Proc. pl. 23, fig. 45. 1853.
“ *nympha Gul.* Ann. Lyc. l. c. pl. 8, fig. 69.

134. **A. grana Newc.** Ann. Lyc. l. c. p. 29.
“ “ “ Zool. Proc. pl. 23, fig. 46. “
“ *granifera Gul.* Ann. Lyc. l. c. pl. 6, fig. 13.
“ *vitriola* “ “ “ “ “ “ 23.
“ *parvula* “ “ “ “ “ “ 24.

135. **A. porcellana Newc.** Zool. Proc. pl. 23, fig. 47. 1853.

is the largest of *A. reticulata.* I have had the last for many years in my collection, and am indebted to Mr. Gulick for specimens of the former.

140. **A. ornata Newc.** Zool. Proc. pl. 24, fig. 55. 1853.

141. **A. albo-labris Newc.** Zool. Proc. pl. 24, fig. 56. "
" *nucleola Reeve non Gould.* Mon. fig. 39.

The shell figured by Mr. Reeve, though not a fine specimen, clearly belongs to this species. *A. nucleola* Gould is quite distinct, and is found on the island of Kauai, not Oahu, where this species is met with.

142. **A. solitaria Newc.** Zool. Proc. pl. 24, fig 60. 1853.

Mr. Cuming is rich in possessing two specimens of this rare species.

143. **A. germana Newc.** Zool. Proc. pl. 24, fig. 61. 1853.

144. **A. flavescens Newc.** Zool. Proc. pl. 24, fig. 62. "

145. **A. Helena Newc.** Ann. Lyc. l. c. p. 27.
" " " Zool. Proc. pl. 24, fig. 63. "

146. **A. physa Newc.** Zool. Proc. pl. 24, fig. 64. *young.* "
" *physa Newc.* Proc. Boston Soc. July, 1855, p. 218. *adult.*

147. **A. dubia Newc.** Ann. Lyc. l. c. p. 23.
" " " Zool. Proc. pl. 24, fig. 65. 1853.
" *radiata Pfr. non Gould.* Mal. Blat. 1854, p. 116.

Dr. Pfeiffer confounds three distinct species under the name of *A. radiata* Gould. Having obtained and examined many specimens of each, I do not hesitate to follow the opinions of Mr. Cuming and Mr. A. Adams, who pronounce them distinct.

148. **A. grisea Newc.** Zool. Proc. pl. 24, fig. 66. 1853.
" *radiata Pfr. non Gould.* Mal. Blat. 1854, p. 117.

This species, from the island of Maui *only*, has a reference in Mal. Blat. to "Waianae, Oahu," which is an error of sufficient importance to be corrected. The proportions of this species are constantly different from the preceding; the aperture much larger, and the last whorl much more inflated.

149. **Mastersi Newc.** Zool. Proc. pl. 24, fig. 67. 1853.
" *rubens var. Pfr. non Gould.* Mal. Blat. 1854, p. 129.

Animal longer than the shell, of a fine flesh-color, covered with granulations tipped with carmine; tentacles and anterior superior portion of the body dark brown or black; motions fearless and active. Compare this description of the animal with that of *rubens* Gould, and add that the one is an inhabitant of bushes (the "Olona"), the other always burrowing, and collected them by the thousand, and compared the animals of the varieties. The animal is of a uniform light slate-color, with very black tentacles. With this table of synonyms no remarks are called for with reference to its being a variety of *viridans* Mighels.

151. **A. variabilis Newc.** Zool. Proc. pl. 24, fig. 70. 1853.
" *fulva Newc.* " " p. 208. 1855.
" *lactea Gul.* Ann. Lyc. l. c. pl. 6, fig. 27.

The fine large white variety described by Mr. Gulick, first suggested the name of *variabilis* for this variable species.

I omit the description of the animal of this and many other species as having no practical importance in this connexion.

152. **A. crassa Newc.** Zool. Proc. pl. 24, fig. 71. 1853.

153. **A. Buddii Newc.** Zool. Proc. pl. 24, fig. 73. "
" *pexa Gul. young.* Ann. Lyc. l. c. pl. 6, fig. 26.
" *plumata Gul. var.* " " " " 7, " 41.
" *papyracea Gul. var.* " " " " 7, " 48.
" *cæsia Gul. var.* " " " " 8, " 53. *young.*

Animal, when in motion, longer than the shell; rather slender; base of foot light yellow; upper and anterior portion of body and tentacles slate; sides and mantle of a light flesh color; movements lively.

Mr. Gulick has thought these varieties worthy of *specific* names and descriptions. While believing that he refines too closely for practical or scientific purposes, I wish to award him the merit of close application, and a just appreciation of the merits of this beautiful study.

154. **A. biplicata Newc.** Zool. Proc. pl. 24, fig. 75. 1853.

155. **A. semicarinata Newc.** Zool. Proc. pl. 24, fig. 76. 1853.

156. **A. moesta Newc.** Zool. Proc. pl. 24, fig. 77. 1853.

157. **A. obscura Newc.** Zool. Proc. pl. 24, fig. 78. 1853.

158. **A. concinna Newc.** Zool. Proc. pl. 24, fig. 79. 1853.

159. **A. undulata Newc.** Boston Proc. 1855, p. 218.

160. **A. nigra Newc.** Boston Proc. 1855, p. 219.

161. **A. tetrao Newc.** Boston Proc. 1855, p. 219.

Animal, above tessellated brown and white; mantle of a dusky yellow; bottom of foot of same color, margined with white; tentacles long and of light brown; motions timid.

162. **A. succincta Newc.** Boston Proc. 1855, p. 220.
" *marginata Gul.* Ann. Lyc. l. c. pl. 6, fig. 7.

163. **A. zebra Newc.** Ann. Lyc. l. c. p. 142.

172. **A. resinula Gul.** Ann. Lyc. l. c. pl. 6, fig. 2.

173. **A. saxatilis Gul.** Ann. Lyc. l. c. pl. 6, fig. 15.

174. **A. terebralis Gul.** Ann. Lyc. l. c. pl. 6, fig. 21.

175. **A. exilis Gul.** Ann. Lyc. l. c. pl. 6, fig. 16.

176. **A. stiria Gul.** Ann. Lyc. l. c. pl. 6, fig. 22.

177. **A. versipellis Gul.** Ann. Lyc. l. c. pl. 7, fig. 44.

This beautiful species is very poorly illustrated in the figure referred to above.

178. **A. cucumis Gul.** Ann. Lyc. l. c. pl. 7, fig. 45.

179. **A. trilineata Gul.** Ann. Lyc. l. c. pl. 7, fig. 46.
" *zonata Gul. var.* " " " " 8, " 58.

180. **A. fuscula Gul.** Ann. Lyc. l. c. pl. 6, fig. 8.

181. **A. formosa Gul.** Ann. Lyc. l. c. pl. 8, fig. 55.

This is a very beautiful species, and worthy the name which it bears.

I desire to make my acknowledgments to Mr. Gulick for a loan of his typical specimens, by which I have been enabled to compare his with the species described by other authors. There is much difficulty in fixing the boundary of varieties, and much must necessarily be left to arbitrary opinion. I have given my own convictions, after ample opportunities for observation and study, but do not claim for myself absolute accuracy in my powers of discrimination. Those who choose to differ from my conclusions are at full liberty to use their own judgment or opinions, and to draw from this article only such aid as they may find useful.

An anatomical description of the animals would in many cases have been preferable to the slight external characters given; but my facilities for examining their dentition were entirely insufficient, and my time too much employed, to enter into a series of minute dissections.

I cannot close these remarks without acknowledging the kindness of H. Cuming, Esq., of London, who has rendered me very great assistance by opening his fine collection for my examination, and lending me the aid of his critical eye, disciplined by a long course of study and close observation, in this and in various other departments of scientific inquiry.

XXXVII.—*Remarks on Certain Species of North American Helicidæ.*

(*Continued from page* 302.)

Helix *Pennsylvanica Reeve* Conch. Ic. No. 676, ex parte,	1852
—— *clausa W. G. Binney* Reprint of Say's Desc. p. 17, (non Ferussac.)	1856.

Say thus described this species in the Journal of the Academy:—

"H. CLAUSA.

"Shell fragile, slightly perforated, subglobular, yellowish horn color, above convex; whorls four or five; aperture slightly contracted by the lip; lip reflected, flat, white, nearly covering the umbilicus.

"Inhabits Illinois. Greatest breadth from one-half to three-fifths of an inch.

"A small but handsome species, which somewhat resembles *albolabris*, but is much smaller, more rounded, and is subumbilicate. This shell also occurs, though perhaps rarely, in Pennsylvania."

I have already noticed that this species has been confounded by European authors with *H. Pennsylvanica* Green, and by those of America with *H. Mitchelliana* Lea.

H. clausa Say varies in form, size, and sculpture. Specimens in my cabinet from Selina, Ala., received from Mr. J. G. Anthony, may be described as rather strong than fragile, not shining or pellucid, the umbilicus only about half covered by the reflected lip, depressed rather than subglobular; the shell as strongly striate above and below, as *H. Pennsylvanica.*

I add the measurements of the largest and smallest individuals:

Diam. maj. 18, min. 15, Alt. 10 mill. anfr. 6.
" " 12, " 10, " 7 " " 5.

A specimen from Iowa is very similar to those from Alabama.

From Wisconsin, Missouri, Illinois, and Kentucky, I have forms which agree closely with Say's description,—in these the reflected lip is less thickened, the aperture is more round, the last whorl being more globose,—the umbilicus is more nearly covered, and the striæ are less prominent, especially at the base, than in the Alabama shells.

The measurement of an average sized specimen is:—

Diam. maj. 17, min. 15, Alt. 10 mill. anfr. 5.

Specimens from Tennessee, for which I am indebted to Mr. Postell, are small, extremely thin and pellucid, with the umbilicus generally but little open, the last whorl obsoletely angulated at the periphery.

Diam. maj. 14, min. 12, Alt. 8 mill. anfr. 5.

There is a variety figured by Mr. Shuttleworth (in the plates referred to in my notes on *H. Pennsylvanica*) as *H. clausa Say, var. subalbolabris*. It is, I believe, the globose form, with wider and less thickened lip, and more open umbilicus than in the Illinois shell. I have a specimen about equal in size to the largest one from Alabama,—it is pellucid, shining, and at the base nearly smooth, but showing the fine spiral impressed lines as distinctly as *H. Mitchelliana*. I received it from Ohio.

In the cabinet of the Academy at Philadelphia, there are three shells, understood to be those deposited by Say, labelled *H. clausa* Say, with Ohio as habitat, in the hand-writing of Mr.

ma variety, and alluded, when writing of the covered umbilicus, to *H. Mitchelliana* Lea, which he puts in the synonymy of *H. clausa.*

Mr. W. G. Binney, in his "Notes on American Land Shells" (Phil. Proc. 1857), states that the outline figures in Terr. Moll. (Pl. 4) do not represent *H. clausa;* they are, however, very like my small Alabama or Tennessee specimens.

De Kay describes *H. clausa* as having the umbilicus occasionally entirely covered; and states, erroneously, that it may be considered as a Southern species, extending to New Jersey and New York.

Reeve's figure of *H. clausa* (fig. 676), I have already referred to as being *H. Pennsylvanica.* He gives another (fig. 694), which may be the var. *subalbolabris*, but is more like *H. bucculenta* Gould, without the parietal tooth.

Helix Mitchelliana Lea.

SYNONYMY.

Helix *Mitchelliana Lea* Am. Phil. Trans. VI. 87, pl. 23, f. 71,	1836.
—— *clausa De Kay* N. Y. Moll. p. 31, ex parte, pl. 2, f. 13?	1843.
—— *Mitchelliana Pfr.* Mon. I., No. 760,	1848.
—— " *Desh.* in Fer. Hist. ex parte? excl. fig.	
—— *clausa Binney* Terr. Moll. p. 107, ex parte,	1851.

The following is Mr. Lea's description:—

"H. MITCHELLIANA.

"T. superne obtuso-conicâ, inferne inflatâ, longitudinaliter et subtiliter striatâ, corneâ, diaphanâ, imperforatâ, anfr. 5; aperturâ subrotundatâ; labro reflexo; columellâ lævi.

"Shell above obtusely conical, below inflated, longitudinally and finely striate; horn color, transparent, imperforate; whorls 5; aperture nearly round; outer lip reflexed; columella smooth.

"*Remarks:* I am indebted to Dr. Mitchell for this shell, which was sent to him by a friend from Ohio. It is rather larger than the *H. clausa* Say, and *H. jejuna* Say, but in form resembles them. It may be distinguished from the latter in not being perforate, and from the former in having a sharper lip. In its striæ it is distinct from both, in having them larger and much better defined.

"*Hab.* Ohio. Diam. 7. Length .4 of an inch."

Lea's description agrees fairly with the shell now known in our cabinets as *H. Mitchelliana.*

Looking at his "Remarks," however, I cannot wonder at the many doubts which have arisen as to the shell intended to be indicated, inasmuch as the comparison with *H. clausa* and *H. jejuna* scarcely admits of satisfactory explanation.

The fact is, that Lea misapprehended both species, as I learn from correspondence with him,—he had in his cabinet under the latter name, a small form of *H. clausa*, and I have reason to believe that a variety, with imperfectly developed lip, of the very shell which he was about to describe as *H. Mitchelliana*, represented the former species. The language used by Lea shows that he referred to an *imperforate* shell as *H.*

The size is somewhat variable. I add the measurements of the largest and smallest individuals:—

Diam. maj. 17, min. 14, Alt. 9½, mill.
" " 15, " 13, " 9 "

Helix jejuna Say.

SYNONYMY.

Helix *jejuna Say* Jour. Acad. N. Sci. Phila. II. p. 158,	1821.
—— *Mobiliana Lea* Proc Am. Phil. Soc. II. p. 82,	1841.
—— " " Obs. IV. p. 17.	
——*jejuna De Kay* N. Y. Moll. p. 46, .	1843.
—— *Mobiliana Pfr.* Mon. I. No. 844,	1848.
—— " *Binney* Terr. Moll. II. p. 172, pl. 42, fig. 2,	1851.
——*jejuna W. G. Binney* Reprint Say's Descr. p. 19,	1856.

Say's description is as follows:—

"HELIX JEJUNA.

"Shell subglobular, glabrous, pale reddish brown; volutions five, slightly wrinkled, regularly rounded; spire convex; suture rather deeply impressed; aperture dilate lunate; labrum a little incrassated within, not reflected; umbilicus open, small.

"Breadth rather more than one-fifth of an inch. Inhabits the Southern States.

"Animal—light reddish brown, with a granular surface, longer than the breadth of the shell; oculiferous tentacula elongated, and rather darker than the body.

"This shell is very closely allied to *H. sericea* of Southern Europe, but it differs from that species in being destitute of the hirsute vesture. I found several specimens of *jejuna*, during an excursion some time since into East Florida, at the Cow Fort on St. John River. It is in the collection of the Academy."

This species has not hitherto been identified, and unfortunately no authentic specimen of it is now to be found in the Cabinet of the Academy.

In the letter from Dr. Griffith to Dr. Binney, quoted at page 353, the former mentions having specimens of a shell given to him by Mr. Lea for *jejuna*, but not answering Say's description. Mr. Lea, in his descriptions of *H. Mitchelliana* and *H. Mobiliana*, refers to *H. jejuna*, but admits, as I have already stated, having had under the latter name *H. clausa* Say.

It is singular that no allusion to *H. jejuna* is made by Dr. Binney in the "Terrestrial Mollusks," excepting by name only, in the lists in the first volume showing the geographical distribution of species.

Pfeiffer, not knowing the species, copies Say's description. In a letter, however, received by Mr. W. G. Binney from Pfeiffer, in the early part of the present year, he asks, "might not *H. Mobiliana* Lea be identical with the lost *H. jejuna* Say?"

I believe that the question may safely be answered in the affirmative; indeed I do not hesitate to accord to Dr. Pfeiffer the merit of having discovered the lost species.

Lea's description of his species is as follows:—

Dr. Binney (in Terr. Moll.) very accurately describes Lea's species; he says, " lip white, very narrow, reflected, a deep groove behind it; aperture well rounded, semicircular, considerably contracted by the impressed groove behind the lip, and a corresponding testaceous deposit, or rib, within." He remarks in addition: " a great part of the specimens have the aperture in a much less developed condition, the lip being acute, or the reflection but partly completed, and the depression behind the lip not visible."

I have many specimens of *H. Mobiliana*, collected in the old Cemetery at Savannah, by Bishop Elliott, and on St. Simon's Island, by Mr. Postell; in none can the lip be said to be, in the ordinary acceptation of the term, *reflected*, excepting slightly at the base of the aperture, and by the umbilicus.

With respect to the animal of *H. Mobiliana*, Mr. Postell has favored me with the following note: " Animal longer than the shell, very light yellowish; granulate; superior tentacles very dark, almost black, with a dark brown stripe running along the body, from the base of each; inferior tentacles much shorter, of same color as the body." This description agrees to a considerable extent with Say's *H. jejuna*. I attach very little importance to the difference in color of the body of the animal.

Lea describes the species as having six whorls. I have not seen any specimen from the habitat assigned by him, but all in my cabinet have from four and a half to five whorls.

In the Spring of the present year I received many interesting shells from Mr. O. M. Dorman, collected by him at St. Augustine, and on the St. John's River, Florida, in the neighbourhood of the Cow Ford,* mentioned by Say. Among them were several very young shells, which I was unable to determine. Subsequently I had from the same gentleman additional specimens, more, but not fully, mature, yet sufficiently so to enable me to identify them with certainty as *H. Mobiliana*.

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* Say speaks of the "Cow Fort," but I believe that Mr. Dorman's designation of the locality as the " Cow Ford," is correct.

This shell in its fresh state has a very delicate epidermis, having a silky lustre. The lower half of the first and part of the second whorl have microscopic raised spiral lines, which I have detected in the specimens received from Bishop Elliott and Mr. Dorman.

The size is variable, viz.:—

Diam. maj. 8, min. 7, Alt. 5½ mill. anfr. 5, Savannah.
" " 6, " 5, " 4 " " 4½ St. Simon's Is.
" " 7, " 6, " 4 " " 5 St. John's River.

Helix porcina Say.

SYNONYMY.

Helix *porcina Say* Long's 2d Exped. to St. Peter's River, II. p. 257, pl. 15, fig. 2. 1824.
—— *hirsuta Binney* Terr. Moll. II. p. 150 (*young*), 1851.

Say's description is as follows:—

"H. PORCINA.

"Shell depressed, yellowish brown; epidermis rugose, with minute, It seems to me in the highest degree improbable that Say would fall into such an error as to describe a young *hirsuta* not only as an adult shell, but even as a different species.

Unfortunately no authentic specimen is now in existence, and no record of the examination of one by any of Say's contemporaries. Dr. Binney does not refer to the species in the Boston Journal, and in the Terr. Moll. only in the few words above quoted. De Kay and Pfeiffer merely copy Say's description.

That Say's figures accurately portray the species, may be inferred from the correctness of those of the other shells represented on the same plate. The outline figure, showing the natural size, exhibits an aperture by no means agreeing with that of an immature *hirsuta*, having rather more than four whorls.

Say describes the epidermis of *H. porcina* as *rugose*, with minute, very numerous *bristles*. The epidermis of *hirsuta* and *fraterna* is not mentioned, but the one species is said to be "covered with short, numerous, rigid *hairs*," and the other to be "minutely hirsute." In his description of *H. palliata*, say uses the expression "epidermis fuscous, rugose, with very numerous minute tuberculous acute prominences;" he was unacquainted with the character of the epidermis of *H. inflecta* when he published its description. In his remarks on that species he says, "several specimens were found, but all dead shells, and destitute of their epidermis." If Say's types of *H. porcina* were young shells, they were surely rather of *H. inflecta* than of *hirsuta*. I have specimens of the former from Michigan, sent to me by Professor Winchell, and from Georgia by Bishop Elliott, which, as regards the epidermis, lead to that conclusion.

I anticipate, however, that further researches will prove this to be a distinct species. The publication here of Say's description and figures will surely induce inquiry.

Helix pustula Fer.

FIG. 1, p. 352.

SYNONYMY.

Helix *pustula Fer.* Desh. in Fer. Hist. I. p. 78. No. 102, t. 50. fig. 1.
—— " *Pfr.* Mon. I. p. 422. No. 1096, 1848.
—— " *Chem.* ed. II. Helix. No. 389, p. 376, t. 65, fig. 18–20!
—— " *Rv.* Conch. Icon. No. 721, pl. 121, 1852.
—— *leporina W. G. Binney*, Notes on N. Amer. Land Shells, Proc. Acad. Phil. p. 191, ex parte. 1857.
(non Binney in Terr. Moll.)

The following is a copy of the description by Deshayes,—

"H. PUSTULA.

"T. orbiculato-depressâ, tenue striatâ, anguste umbilicatâ; umbilico obtuso; rufâ vel pallide corneâ; anfr. angustis, convexiusculis, suturâ alt. 3 mill." In Mon. III. he has the following, as variety of *H. pustula*,—

> β. *pilosa*, umbilico fere omnino obtecto. (Mus. Cuming. spec. authent.)
> *H. leporina Gould* in Proc. Bost. Soc. 1848, p. 39.
> " " *Reeve* Conch. Ic. No. 722, t. 121.

I suspect that Pfeiffer's description in vol. I. rather refers to *H. leporina*. In Vol. III. Pfeiffer suggests that *H. Lecontii* Lea may be an umbilicate variety of *H. pustula*,—it is identical with *H. loricata* Gould.

The magnified figure (fig. 20) in Chem. ed. 2, is quite unintelligible.

Dr. Binney in Terr. Moll. describes as *H. pustula* Fer. a shell which I believe to be entirely distinct. He says of it,—"the spire is flat, has five closely revolving, rounded whorls, separated by a deep suture, the outermost obtusely angular at its upper limit; beneath convexly rounded into a large umbilicus, one-third the breadth of the base, and exhibiting the other whorls within, and with a constriction behind the lip." He mentions that it is found at Darien, and Lee county, Georgia, and in Florida. In his "Remarks" Dr. Binney speaks of the umbilical perforation as being "far broader than in any other of the polygyral group."

Comparing the two descriptions above quoted, I was for some time at a loss to understand Dr. Binney's species.

In the early part of the present year I received, through the kindness of Dr. Wilson of Darien, Ga., several specimens which I found to be the *H. pustula* Binney. This led me more carefully to examine a number of hirsute shells, collected by Bishop Elliott, Mr. Postell, and Mr. Dorman, which were labelled in the cabinets both of Mr. W. G. Binney and myself, *H. leporina* Gould. I am now satisfied that they are *H. pustula* Fer., distinct from *H. leporina*, and that Dr. Wilson's Darien shell, the *H. pustula* Binney, is an undescribed species.

The groove within the umbilicus, is a very marked feature in Ferussac's species (see fig. 1, p. 352), and though not referred to in the description is distinctly shown in one of his figures; it is entirely wanting in *H. leporina*, and also in the Darien shell (fig. 2, p. 352). This groove is not only an external character, but its presence modifies the internal structure of the shell. On opening the base of the last whorl immediately behind the aperture, a strongly developed transverse tubercle is seen within, from which a strong ridge-like lamella runs round the umbilical opening, corresponding in extent with the groove. This tubercle, and the extension of it, are entirely disconnected by a sinus or channel from the floor of the penult whorl.

The hirsute character of this species is not alluded to by any author. The outer edge of the peristome in specimens from St. Augustine, is of a deep rose color.

In his "Notes on American Land Shells," Proc. Acad. Phil. 1857, Mr. W. G. Binney gives St. Simon's Island and Savannah, Ga., as habitats of *H. leporina*. He refers to the shells above alluded to as to which we both were in error, and which we have since determined to be *H. pustula* Fer.

The measurements of a specimen of average size, are as fol-

The following is a copy of Dr. Gould's description:

"H. LEPORINA.

"T. parvâ, lenticulari, lucidâ, rufo-corneâ, pilosiusculâ, leviter striatâ, vix perforatâ; spirâ depressâ, anfr. 5, convexiusculis, ultimo supernè subangulato; regione umbilicali excavato; aperturâ lunatâ, labro incumbente, reflexo, roseo, dentes duos albos sinum amplectentes gerente; lamellâ columellari obliquâ, albâ, erectâ, acutâ, rectangulari, callo lineari supernè ad angulum aperturæ junctâ. Diam. $\frac{1}{4}$, alt. $\frac{1}{8}$ poll. Hab. Mississippi and Arkansas.

"Intermediate between *H. hirsuta* and *H. inflecta*, though smaller than either. It is less globose than *hirsuta*, while the aperture is much the same, except that the sinus of the lip is formed by the projection of two teeth instead of by an emargination, in this respect resembling *H. inflecta*. From the latter it differs in the columellar tooth. It resembles *H. pustula* still more, but the umbilical region wants the peculiar channel of that species."

Pfeiffer states, in his before-mentioned letter to Mr. W. G. Binney, that he now thinks this species distinct from *H. pustula* Fer.

Reeve remarks,—"It has been much doubted whether this and *H. pustula* are not varieties of the same, still the smaller shell has the larger umbilicus." He gives as habitat, Tennessee.

H. leporina is larger than *H. pustula*, less elevated, the whorls are less convex, the incremental striæ less numerous and distinct, and the aperture is wider. The umbilicus is more nearly covered by the lip, and is without the groove which prevails in Ferussac's species.

Within and near the aperture, there is what may be called the "*fulcrum*," extending from the floor of the last to that of the penultimate whorl, and approaching in character to, but less strongly developed, than that in *H. monodon* Rack. The outer edge of this *fulcrum* is uneven,—in one of my specimens somewhat denticulated.

The measurements of a rather large example are,—

Diam. maj. 6, min. 5, alt. 2½ mill.

In my cabinet is a specimen from Green Co., Indiana, received from Dr. T. R. Ingalls, one from the vicinity of Helena, Arkansas, for which I am indebted to Mr. H. Van Nostrand, —and one given to me by Mr. W. G. Binney, as to the habitat of which I am uncertain. Mr. Binney has a specimen collected in Illinois.

Helix pustuloides Bland.

Fig. 2. Page 352.

SYNONYMY.

Helix *pustula Binney* Terr. Moll. II. p. 201, pl. xxxix. fig. 3. 1851.

T. late et perspective umbilicatâ, planorboideâ, tenuiusculâ, rufo- vel pallide-corneâ, minute striatulâ; epidermide tenui, pilosiusculâ; spirâ

but especially the penult whorl; aperture oblique, crescentic, with erect, oblique, white parietal lamelliform tooth, joined to the upper angle of the aperture by a slightly arcuate, filiform callus; peristome reflexed, with margins approaching, and having two dentiform lobes separated by a deep fissure.

Diam. maj. 5½, min. 4½, alt. 2½.

Habitat.—Near Darien, Georgia. For the specimens in my cabinet I am indebted to Dr. S. W. Wilson. As to the *station* of the species, I copy the following from one of his interesting letters:

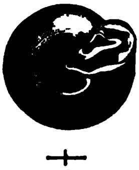
"The place has an eastern exposure to the sea, high tides rising to the base of the low bluff where they exist. The growth of trees, which consists mostly of live oak and *Celtis occidentalis*, has never been cleared off; the *Palmetto serrulata* flourishes as an undergrowth. The soil is covered for a few inches in depth with oyster shells thrown there by the Indians, and decayed leaves and fragments of branches are of course over all these, under which, and among the superficial oyster shells, the Helices live. *H. pustula* is nowhere near, or at least a rigid search did not reveal any. *H. concava* (dead) occurs in small numbers. *H. inflecta* abundantly."

I have one dead specimen from Alabama, sent to me by Mr. Anthony.

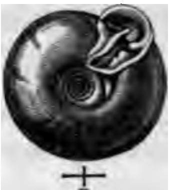
Observations.—In my notes on *H. pustula* Fer. I have referred to Dr. Binney's description of the shell now under consideration. *H. pustuloides* is intermediate in size between *H. pustula* and *H. leporina*—is less globose than the former, and more sparingly hirsute. It differs widely from both in the character of the umbilicus—the aperture is much like that of *pustula*, but more narrow than that of *leporina*. The inferior tooth on the peristome is more developed laterally than in *H. pustula*—indeed it has a somewhat bifid appearance, in which respect it is more allied to *H. leporina*.

The *fulcrum* in *H. pustuloides* is of the same nature as that in *H. leporina*, but less developed, and with the outer edge entire.

The accompanying figures show the base of *H. pustuloides* (fig. 2) and *H. pustula* (fig. 1).



1



2

Dr. Binney's figure imperfectly represents the former, and as regards the size of the umbilicus is inconsistent with his description.

Helix glaphyra Say.

Say's description was published in Nicholson's Encyclopædia (Amer. Ed. 1816), and is as follows;—

tember, 1840, to his father, the late Dr. Amos Binney, by Dr. Griffith.

"*H. fuliginosa*, same as *lucubrata*, and this last name should perhaps be adopted, as I never published, except in cabinets; it was well known by this name long before Say published, but by the laws of nomenclature he is entitled to priority. There has been some dispute as to the identity of this (*fuliginosa*), *inornata*, and what is generally considered as *glaphyra*, but I think they are distinct. *H. fuliginosa* has five whorls, dark colored, umbilicus large, lip internally white; *inornata* is smaller, lighter colored, umbilicus partially covered, five whorls, shell not shining; what is called *glaphyra* has five whorls, horn colored, shining, umbilicus partially covered. These three shells are closely allied, but I think distinct."

"*H. glaphyra*, the original specimen of this shell, I have often seen and studied, and always considered it as *nitens*. It was in the collection of the Academy of Sciences, but being broken was probably discarded when the Cabinet was arranged—the shell usually known as *glaphyra* is that alluded to above."

Dr. Griffith, it seems, at the date of the above letter, considered his *fuliginosa* and *H. lucubrata* Say to be identical—referred to the species now known under the name of *H. lævigata* Raf. as *H. inornata* Say, and to *H. inornata* Binney as the species usually known as *H. glaphyra*,—at the same time expressing his opinion that *H. glaphyra* Say was identical with *H. nitens*, meaning *H. cellaria*.

An amusing letter from Mr. J. G. Anthony informs me of his discovery in 1830 of many specimens of *H. cellaria*, at Providence, R. I. (a species then unknown to him), of his visit shortly afterwards to Philadelphia, and exhibition of the shells at the Academy, where they were pronounced to be *H. glaphyra* Say.

Mr. W. G. Binney, in his "Notes on American Land Shells" (Proc. Acad. Nat. Sci. Phila. 1857), considers the testimony of Dr. Griffith and Mr. Anthony conclusive as to the identity of

H. glaphyra and *H. cellaria*, but I must confess that I am by no means satisfied on that point.

Say died in 1834. I have referred to all that can be cited as evidence of prior date.

Dr. Binney, in the Boston Journal (1840), and also in the "Terrestrial Mollusks," included *H. glaphyra* in the synonymy of *H. cellaria* Müll.

In both works he remarks: "This is the shell which was found by Mr. Say in gardens in the city of Philadelphia, and by him described as *H. glaphyra.* Its restricted habitat in cellars and gardens in the immediate vicinity of maritime cities, long since induced me to suppose it might be an imported species; and an opportunity of examining a considerable number of specimens of *H. cellaria* Müll. brought from England, enables me to say, that it is absolutely identical with that species. Shells of the same size and growth from the European and American localities cannot be distinguished from each other."

Dr. Binney, with respect to the geographical distribution of *H. cellaria*, states that it inhabits the North Eastern and Midimmature state. This is a less delicate shell, but in its earlier stages, when there is but a small umbilicus, there is no inconsiderable resemblance between the two, and it would accord well with the description; but no one familiar with the present species would ever mistake one for the other."

Dr. Binney was probably influenced by Dr. Griffith's opinion as to the identity of *H. glaphyra* and *H. cellaria*, but seems to have arrived at that conclusion rather from the assumed habitat of Say's specimen, than after critical study of his description.

Say states that the shell was taken in Mr. Ord's *garden*, but Mr. Ord has recently informed Mr. W. G. Binney that he found the single specimen, without the animal in it, on his *wharf*.

Dr. Binney, speaking of *H. cellaria*, says, "This is the shell which was found by Mr. Say in *gardens* in the city of Philadelphia, and by him described as *H. glaphyra*."

This is not only erroneous in fact, but conveys the equally erroneous impression that living specimens of *H. cellaria* were collected by Say in Philadelphia. So far as I have been able to ascertain, *H. cellaria* has never been found in that city, or even in the State of Pennsylvania; only in the New England States.

Dr. Binney and Dr. Gould, having under such circumstances pronounced Say's species to be identical with *H. cellaria*, insist on the identity of the *H. cellaria* of America and Europe. On the latter point I entirely agree with them, but the question as to *H. glaphyra* is in no way affected.

Looking at Say's description, I cannot believe that his shell, found by Mr. Ord, was *H. cellaria*. Say describes the umbilicus of *H. glaphyra* as "moderate, not exhibiting the volutions," and compares the species with *H. nitens* of Europe, "particularly in being whitish beneath." At that date *H. nitens* Gmel. and *H. nitens* Maton and Rackett were known to conchologists, the one placed by Pfeiffer in the synonymy of *H. nitida* Müll., and the other in that of *H. cellaria* Müll., both widely umbilicate, and showing the volutions to the apex, but only the latter "whitish beneath." It can scarcely be doubted that Say actually referred to *H. nitens* Mat. and Rack., noticing as a distinguishing character in *H. glaphyra*, that the volutions are not so exhibited in the umbilicus. Say describes three other species of Helix as having the umbilicus "*moderate*," viz. *septemvolva*, *avara*, and *tridentata*. As to the first he adds, "attenuated to the apex so as to exhibit the remaining volutions," to the second, "not exhibiting the volutions," but no further detail is given as to the umbilicus of the third species.

I know not how any one can assume that Say would have described the umbilicus of a shell identical with the European or American *cellaria*, in the language employed by him in his diagnosis of *glaphyra*. The more I study his descriptions, the more I appreciate his general acuteness and accuracy, and believe that full justice has not been done to his labors.

Say described *H. ligera* in 1821 as having the "umbilicus very small," and remarked that it "approaches nearest to *H. glaphyra*, but is readily distinguished by the greater convexity of the spire, and the *smaller* umbilicus."

that of *H. inornata* Binney, and the reflection of the peristome is much like that of *H. ligera.*

European authors can only have formed their judgment on the questions regarding *H. glaphyra* from Say's writings, or those of other American conchologists, or from specimens labelled by them. Pfeiffer* describes a dark colored variety of *H. inornata* Binney under the name of *glaphyra*, as he admits in a late letter to Mr. W. G. Binney.

Reeve's description and figure are also of *H. inornata* Binney.

Deshayes† (Fer. Hist.) has *glaphyra* in the synonymy of *cellaria*, evidently relying on the opinions of Gould and Binney.

The North American shell which agrees most closely with Say's *glaphyra* is *H. inornata* Binney,—it occurs in Pennsylvania, must have been known to Say, and there is abundant evidence to show that many conchologists so interpreted it.

When I visited the Academy at Philadelphia in October, 1857, I found in the cabinet a specimen of *H. inornata* Binney labelled *H. glaphyra* Say, in the handwriting, as I was informed, of Mr. J. Phillips. Mr. W. G. Binney then explained to me, that many years ago Mr. Phillips had charge of the cabinet, and so labelled the specimen referred to, but had since admitted his determination to be erroneous.

With respect to *H. inornata* Say, described as "subglobose," and having "a strong resemblance to *H. ligera*," I cannot acquiesce in the opinion that it has been correctly identified by Dr. Binney. I have already stated my belief that Say's *inornata* is the *H. lævigata* Raf., the species confounded by Dr. B. with *H. lucubrata* Say. On a future occasion I propose to examine these questions more fully, but desire now to place on record the following interesting points relating to them.

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* Pfeiffer (Mon. I. p. 112) suggests that *H. subplana* is the same as his *glaphyra*, but the species are most certainly distinct.

† Deshayes, in his remarks on *H. dissidens* (Fer. His. I. p. 97), conjectures that American conchologists have confounded that species with the *H. cellaria* of Europe. It seems to be rather a variety of *H. concava* Say.

When Dr. Binney was in Paris, he examined the shells in the Museum at the Jardin des Plantes, and among his notes made at the time, and now in the possession of his son, is the following,—"*H. inornata* Say is represented by the shell which I have figured as *H. lucubrata* Say."

Say knew and had a specimen of *H. lævigata*. In the cabinet of Mr. Poulson, at Philadelphia, there is a specimen, as Mr. W. G. Binney informs me, labelled in Say's handwriting "Helix,—Claiborne, Ala."

In 1857, I saw at the Academy specimens of *H. lævigata*, labelled by Phillips, *H. inornata* Say.

For the present I leave *H. glaphyra* Say in the catalogue of North American Helices, as one which cannot be identified with absolute certainty, but under a strong impression that it is identical with *H. inornata* Binney.

It may be said that the question discussed at so much length is of little real importance, but if by showing how Say's species have been misunderstood, I promote a more careful study of his writings, I at least shall be satisfied.

Say thus describes this species in Nicholson's Encyclopædia,—

> "H. ALBOLABRIS.
>
> "Shell thin, fragile, convex, imperforated; with six volutions, whorls obtusely wrinkled across, and spirally striated with very fine impressed lines, a little waved by passing over the wrinkles, both becoming extinct towards the apex, which is perfectly smooth; aperture lunated, not angulated at the base of the column, but obtusely curved, lip contracting the mouth abruptly, widely reflected, flat and white.
>
> "Length of the column three-fifths of an inch; breadth one inch."

The form of the shell referred to by Say has been confounded by European authors with *H. exoleta* Binney (*H. zaleta* Say), from which, however, it is entirely distinct. Dr. Leidy, from whom I sought information on the subject, wrote to me in 1857 as follows: "There is no doubt, I think, that *H. albolabris* and *H. exoleta* are distinct species, as their internal anatomy is quite different." This effectually disposes of the hypothesis of Deshayes, who, writing of the latter species (Fer. Hist.), remarks,—"Il est à présumer que l' examen de l' animal donnera la preuve qu'il est identiquement semblable à celui de l' *albolabris.*" I may add that figs. 19, 20, pl. 10, in Chem. ed. 2. Helix, and fig. 6, pl. 46 A, in Fer. Hist., are of *H. exoleta*, which is erroneously placed in the synonymy of *H. albolabris.*

It will be seen that I do not concur with Dr. Binney in separating *H. major* from *H. albolabris.* Dr. Binney writes (1837), in the Boston Journal,—"Mr. Conrad informs me that he obtained this shell (*H. major*) several years since, in Alabama, and considered it a new species, but was deterred from publishing it as such, by the generally received opinion that it was only a variety of *H. albolabris.*" He observes also,—"this was probably Mr. Say's view, as the specimens figured by Ferussac were received from him."

In the "Terrestrial Mollusks," Dr. Binney thus remarks on *H. major*:—

"It cannot be confounded with any other than *H. albolabris*, and differs from it in the following particulars:—It is much more globose, of a coarser and more solid texture, and the striæ of increase are much more raised and prominent, so much so, indeed, as to leave distinct grooves between them. The revolving striæ, so distinct on that shell, are either wanting or very indistinct. The aperture is smaller in proportion to the size of the shell, less flattened towards the plane of the base, and more rounded. The pillar lip and umbilicus are in many instances covered with a smooth and shining, semi-transparent, testaceous callus. The margin of the lip is thickened, the lip itself is narrower, less abruptly reflected, and not so much flattened, and there is often a tooth-like process on the inner and upper side of the margin near the umbilicus. The color of the epidermis is generally much darker. The only considerable variation in the characters of the shell is caused by the depression of the spire in some individuals, and indeed in all specimens from certain localities. In its most perfect condition it is often subconical. It is subject to some irregularities in the form of the mouth, and there is sometimes an indication of pale bands in the epidermis of the body whorl."

He adds,—

"That this is not the same species increased in size by the influence

With respect to the larger size of *H. major*, it may be observed that species in this, as well as other countries, attain extraordinary development in some particular district—if size alone be considered, there is quite as much reason for separating the *H. tridentata* and *H. alternata* of Ohio from the forms prevailing in the Eastern States, as *H. major* from *H. albolabris*.

The differences in sculpture from certain localities are also very striking. On Long Island, and near Albany, N. Y., there is a small, depressed, almost smooth variety of *H. alternata*,—the Ohio form is striated, while the southern varieties are strongly ribbed. The Ohio *H. tridentata* is almost smooth,—I have examples from Pennsylvania with well-defined, distinct ribs. Some forms of *H. appressa* are without, while others have very numerous fine revolving striæ. Dr. Binney is certainly in error as to the absence or indistinctness of such striæ in *H. major*. They exist in all the individuals of my extensive suite of specimens, including the forms of which he gives figures.

The tooth-like process on the margin of the lip near the umbilicus is by no means a good specific character; it exists in *H. thyroidus* from Georgia and Tennessee, and in *H. exoleta* Binney from Columbus, Ohio; indeed it is shown in the figure of the latter in Terr. Moll. pl. 10. I have noticed it moderately developed in specimens of *H. albolabris* from Ohio and Massachusetts.

I learn from Dr. Leidy that he has not examined the animal of *H. major*. *H. major* and *H. albolabris* are in fact subject to much variation in size, color, texture, sculpture, form of aperture, and lip, and development of the latter, but there are no constant characters in either to justify their separation as distinct species. In my cabinet are specimens which I refer to *H. major*, from Florida, Georgia, Tennessee, and South Carolina, forms which seem to be intermediate from Alabama, Missouri, and Wisconsin,—and of *H. albolabris* from most of the Eastern, Middle, and Western States, as well as from Virginia, North Carolina, and Canada West.

The following are measurements of varieties of *H. major*,—

Diam. maj.	35,	min.	30,	Alt.	23,	mill.	(*globose*),	Florida.
" "	37,	"	32,	"	22,	"	"	Georgia.
" "	45,	"	36,	"	22,	"	(*depressed*),	"
" "	38,	"	32,	"	18,	"	(*flattened*),	"
" "	31,	"	26,	"	18,	"	(*elevated*),	"
" "	32,	"	28,	"	16,	"	(*depressed*),	Wisconsin.
" "	24,	"	20,	"	12,	"	"	Missouri.

The two latter I call intermediate forms—the following *H. albolabris*,—

Diam. maj.	35,	min.	30,	Alt.	19,	mill.	N. Carolina.
" "	32,	"	26,	"	15,	"	Ohio.
" "	28,	"	24,	"	15,	"	Canada West.
" "	26,	"	21,	"	12,	"	Pennsylvania.
" "	23,	"	19,	"	11,	"	Tennessee.

I possess two specimens of the above mentioned Wisconsin shell. Both have a remarkably thick and dark-colored epidermis, the tooth-like process on the lip near the umbilicus very

XXXVIII.—*Synopsis of the Fresh Water Fishes of the Western Portion of the Island of Trinidad, W. I.*

By Theodore Gill.

Read September 13, 1858.

I.

By the kindness and liberality of our friend Mr. D. Jackson Steward of the city of New York, we were enabled this year to undertake a tour through several of the West Indian islands for the purpose of collecting and studying the species of molluscous animals and shells, and incidentally the members of the various other classes known to the zoologist. In pursuance of this object, we visited the island of Trinidad, where we resided for a period of several months, which extended through portions of the spring and summer.

Knowing the intimate relation which existed between the ornithological fauna of the island, and that of the neighboring continent, from the mention of the habitats of the species described or enumerated in the memoirs of Mr. Philip Lutley Sclater and other naturalists, and from the collections which we had the privilege of examining; noticing also the similarity of the mammals, insects, and the terrestrial mollusks to species and groups inhabiting the northern parts of South America, we were induced to inquire if this similarity extended to the other groups, and for this purpose to devote especial attention to those two classes of the vertebrated animals,—the reptiles and the fishes,—which had been most neglected. As most of the species of the ichthyic class which inhabit the Gulf of Paria, and the seas which bound the island on the north and east, were found to be the same as those distributed through the entire Caribbean sea, very few were preserved, attention being chiefly confined to those living in the fresh waters of the island.

II.

In the first collection of fluviatile fishes which we had the privilege of examining, there were found to be species of the genus *Hypostomus* of Lacepede and of the *Callichthys* of Linnæus,—one which represented the naked Siluroids and belonged to one of the South American types of the extensive genus *Pimelodus*, as it has been adopted by Valenciennes in the "Histoire Naturelle des Poissons," and finally, a species of the family of Cyprinodonts of Agassiz. The first three are members of groups nearly peculiar to South America. It was consequently discovered at an early period of our investigations, that the resemblance which existed between the mammalian and ornithic faunæ of the island extended also to the fishes of its rivers. Believing that these facts would be interesting contributions to the knowledge of the geographical distribution of animals, and having many new species and genera which we were desirous to make known, we have prepared the present synopsis.

It is not our intention in this communication to discuss the geographical distribution of fishes of the island. We defer in more detail, and those representing new genera will be fully illustrated.

With the intention of rendering this memoir more useful to the inhabitants of Trinidad, and to facilitate the identification of the fishes described, we have given the popular names, whenever they have been ascertained, by which the species or groups of allied species are known in the island; but there, as in almost every country, only the larger and more remarkable species have had such names bestowed on them. As is almost universally the case among those who are unlearned in zoology, most of the rare and small species have no vernacular names, the latter being generally regarded as the young of larger ones, and all the species of a genus, when there is not a marked difference in color or some trenchant peculiarities, are confounded under a single specific name.

IV.

In the early part of the present year, a work was published by Dr. L. A. A. De Verteuil, a physician of considerable attainments residing in the island, on "Trinidad; its geography," &c. To this volume there is an appendix on the "Natural history of Trinidad," the zoological portion of which contains a chapter on the "Mammalia," and a catalogue of the indigenous species, by the author of the volume; "an essay on the Ornithology of Trinidad, by Antoine Leotaud, M.D.P.;" a "catalogue of reptiles by Dr. J. Court," and one of fishes by Dr. Leotaud. The latter is stated to "exhibit nearly all the genera which may be said to belong to the island;" it will be observed what reliance this statement is entitled to, on a comparison of his catalogue of the genera represented by fluviatile species with those given in our synopsis. We had almost determined to pass it over in silence, but on subsequent reflection, it was deemed advisable to call the attention of naturalists to it and to correct its errors, in order that none should imbibe false views on the subject of the geographical distribution of groups and the habits of species, for such would be the result if the genera of the catalogue were regarded as correctly identified. So flagrant are some of these errors that the very improbability of their commission by one having any pretensions to scientific lore might well mislead the naturalist.

Dr. Leotaud, adopting the classification of Cuvier, and professing also to adopt his genera, has given a catalogue of sixty-seven genera, and has noted as representing them less than two hundred species of the osseous fishes of that naturalist. Of these sixty-seven genera, nine are indicated as being represented by fresh water species; one of these genera is represented as containing both marine and fluviatile species, and the others have only fresh water species attributed to them.

We will now give in the author's own words, such parts of the catalogue as relate to the species which form the subject of our synopsis; the notes which we place after the species to which they refer, are, in the original, placed at the bottom of the page.

“ *Order* I.—ACANTHOPTERYGIANS.

Family V.

Family III.

SILUROIDES.

Mystus.—2 species.

The common catfish or machoiran, and the barbe, an inhabitant of our rivers.

Callichthys.—2 species.

Cascaradura, and a small fish found in clear streams.

Hypostomus.—1 species.

Anne Marie.

Family IV.

SALMONIDES.

Hydrocyon.—2 species.

Fresh-water sardines.

Family V.

CLUPEÆ.

Erythrinus.—2 species.

Guabine and yarrao, two fresh-water fishes; the former very common in ponds, ravines, and rivers; the latter found only in clear rivulets.

Order III.—APODAL MALACOPTERYGIANS.

ANGUILIFORMS.

Synbranchus.—1 species.

Dog headed eel, or anguille-tête-chien, abundant in ponds and ravines."

As none of the above fishes are described, the only means for their identification are in the notes of Dr. Leotaud, referring them to the vernacular names, which a person who has resided in the island, or who has identified the species with those names, can alone know. With this qualification, we will now proceed to identify and refer them to their proper genera.

The species known to the inhabitants of the island as the "brochet," and referred to Gerres by Dr. Leotaud, belongs to the genus Crenicichla of Heckel, of the family of Chromidoids.

The "coutelas," or "cutlass fish," belongs to the genus Carapus Cuv., of the family of Gymnotidæ, and has no other relation to the Scombroid genus Trichiurus than as a member of the same class, and its only resemblance consists in the elongation of the tail into a filament. It has not the most remote resemblance to the Lamprey, and even belongs to a different subclass.

The fishes referred to Pœcilia would have been placed by most naturalists in the genus Hydrargyra of Lacepede.

Of the Siluroids referred to the genus Mystus, the fresh water species belongs to the genus which we call Pimelenotus; in conformity with the system adopted, it should have been placed in the catalogue in Pimelodus. The marine fish is a Bagrus, of which genus there is more than one species in the island.

There are three genera and at least four species of mailed Siluroids belonging to the old genus Callichthys. The true Cascaduras belong to the genus Callichthys as revised by us, and our new genus Hoplosternum; the "small fish" is nearly allied to Callichthys paleatus of Jenyns, and belongs to the Swainsonian genus Hoplosoma.

The "Anne Marie," or "Tata," as it appears to be more commonly called, is rightly identified as belonging to the genus

V.

In addition to the species given in the catalogue, several others are noticed in the subsequent remarks on their habits and uses. It is said that "Besides the above, there are the common eel (Anguilla) and the Coscorob, very common in ponds and rivers, the cats (Callichthys?). I have also been told that a *trout* is not scarce in our mountain streams; this fact I have not been able to ascertain."

There are two species called "Coscorobs," both of which belong to the family of Chromididæ and the genus Cychlasoma of Swainson, or Acara of Heckel; they might have been placed, as had been done by previous writers, in the genus Chromis.

The "common eel" we were unable to obtain, but there is undoubtedly a species of eel which is not a Synbranchus, and which probably belongs to Anguilla or some allied genus. We have never seen it.

The common river cat-fish or Pimelenotus was twice brought to us as the trout, but as the species mentioned by Dr. Leotaud is said to be found in the mountain streams, it is probably a different fish, and perhaps belongs to the family of Characini of Müller and Troschel.

We have been unable to identify the fishes called by the Doctor "Cats (Callichthys?)." They have never been seen by us, and we were never able to obtain a description from any of the residents. Do they belong to the genus Doras of Lacepede?

A species of Siluroid has been described to us as resembling the common river cat-fish in almost every feature, but wanting the barbles; it was stated to be very rare, and only found in the Caroni river, the chief stream on the western side of the island. This fish very probably belongs to the genus Ageniosus of Lacepede.

VI.

We embrace this opportunity of rendering our thanks to the gentlemen of Trinidad who have contributed to us specimens of the fishes of the island, or who have otherwise assisted us in our ichthyological researches.

To our kind and excellent friends, Messrs. Frederick A. Searles and Frederick Weedon of Orange Grove, Tacarigua, we are especially indebted. While partaking of their hospitality, their acquaintance with the island enabled them to point out and direct us to many interesting localities that might have otherwise been unknown. Mr. John Wilson, also of Tacarigua, procured for us several additional individuals of some rare fishes of which we had previously only unique specimens, and which we describe as the Corynopoma Veedonii, the Stewardia albipinnis, and the Nematopoma Searlesii. By the aid of the above gentlemen, and especially of Mr. Wilson, we were also enabled to obtain a very complete collection of the reptiles of the island, a catalogue of which will be given in a subsequent paper in these "Annals."

assisted by the kindness of Mr. J. Carson Brevoort, who allowed us the use of his extensive and well assorted library, which surpasses in the number and value of ichthyological memoirs and volumes, any other in New York. The officers of the Smithsonian Institution of Washington have also enabled us to consult the library of the Institution.

Specimens of most of the species which are herein described have been deposited in the museum of the Smithsonian Institution, and in the private cabinets of Messrs. Steward and Brevoort.

VII.

We will now proceed to describe the genera and species represented in the Island. The classification which we have adopted is a modification of that of the late Dr. Johannes Müller.

Sub-class.

Teleostei, Muller.

Order.

ACANTHOPTERYGII, Artedi, Cuv.

Family.

Sciænidæ, Cuv.

Sub-family.

Polycentrinæ, Gill.

Genus.

Polycentrus, Mull. and Troschel.

Body ovate, compressed, covered by moderate ctenoid scales.

Head with the profile triangular, thin, compressed, rounded above.

Mouth rather large, with the gape linear-elliptical. Lower jaw passing beyond the upper. The intermaxillaries form the entire arch of the upper jaw and are very extensible, and when retracted enter between the orbits.

Teeth on the intermaxillaries and dentary numerous, card-like, with recurved summits: two small patches of similar teeth on the chevron of the vomer.

Lips thin.

Tongue slender, sub-linear, and destitute of teeth.

Lower pharyngeal bones double, together forming a nearly equilateral triangle, separated by a furrow in the middle, and with a posterior sinus: covered by card-like teeth.

Branchiostegal rays six.

Nares two, subrotund, of nearly equal size, in a bare oval space; the posterior one immediately before the eye.

Operculum with an angular spine, preoperculum deeply serrated at the inferior margin and for a short distance above the angle: first infra-orbital serrated.

The various bones of the opercular apparatus and the head

Ventrals triangular with one spinous and five soft rays.
Pectorals rounded.

The genus which we have now described was first indicated by Drs. Müller and Troschel in Sir Robert Schomburgh's "Reisen in Britisch Guiana," and afterwards described in more detail in the third volume of the "Horæ Ichthyologicæ." It was founded on a single species brought from Guiana by Schomburgh. Its natural affinities appear to us to be at present not well determined. By Müller and Troschel it was placed in the family of Sciænidæ, and in deference to their opinion we have so retained it, regarding it, at the same time, as the type of a distinct tribe. In the great length of the ascending branches of the intermaxillaries, and the consequent power of protraction of the jaws, it resembles the Mænidoids. The spinous portion of the anal is of extraordinary length, and is only equalled by that of the fishes of the genus Etroplus of Valenciennes among the Ctenolabroids, and by some of the Anabantidæ. Only a single species of the genus has been hitherto described; it has been called by Müller and Troschel, Polycentrus Schomburghii; the number of anal rays in that species is thirteen, and the color is indicated by the single word "braun." The species of Trinidad has one more ray than its congener, and differs widely from it in color. In allusion to the last character we have given its specific name.

Polycentrus tricolor, Gill.

Body oblong oval, highest at the fifth and sixth dorsal spines: the head forms one-third of the entire length, and is shorter by an eighth of its length than the highest part of the body. The diameters of the eyes are rather more than a quarter the length of the head; they are separated from each other by a space nearly equal to one of their diameters, and about the same distance from the snout. The body is crossed at its place of greatest depth by fourteen rows of scales.

The dorsal fin commences above the base of the opercular spine; the anal under the sixth spine of the dorsal.

D. xviii. 7. A. xiv. 7. C. 16. V. i. 5. P. 12.

The ground color is whitish brown, striped with longitudinal lines of dark brown running along the angles of each row of scales. The bases of the vertical fins are purple; the remaining portions brownish white with numerous scattered black dots. The ventrals are purple, dotted with black; the pectorals white, immaculate. Head dark brown, dotted with black.

Only two specimens of this fish were obtained, one of which was taken in the "Tranquil river," a small narrow stream, three or four feet in depth, with a muddy bottom, and few or no stones. The other was captured by Mr. John Wilson, in the "Arouco river," under similar circumstances, and in a place where a number of the larger branches of trees clogged the stream. Both were caught in company with Cychlasoma tænia, and with species of Poecilurichthys hereafter described.

towards the angles; from the angles, the radiated striæ on the posterior fields of the scales originate.

Head; when not inflated, long, laterally compressed, above broad and rather flat behind the eyes; the latter are horizontal, and closely approximated.

Mouth terminal, moderate, with the gape elliptical, jaws subequal. The intermaxillaries which alone form the arch of the upper jaw are moderately protractile, the ascending branch being more than half the length of the horizontal one, and retractile to about the anterior borders of the orbits.

Teeth on both the intermaxillaries and dentaries in an anterior row, slender, subcylindrical, recurved, behind which are many similar, but smaller ones. The remaining bones of the mouth and the tongue are without teeth.

Tongue oblong, with the angles blunt, and with the front emarginate, attached to within a short distance of the margin to the floor of the mouth by the skin.

Lower pharyngeals together forming an elongated triangle, with the sides and posterior broadly emarginate and with a shallow furrow running through the middle: teeth not numerous, long and slender.

Branchiostegal membrane attached to anterior part of the thorax, and containing five rays.

Lateral line obsolete.

Dorsal double; the anterior one rises above or slightly behind the base of the pectorals, and is of a subtriangular form, supported by slender spines; the posterior one is long, moderately high and subequal.

Anal smaller than second dorsal, terminating at the same distance from the head.

Caudal with the margin rounded.

Ventrals funnel-shaped, united anteriorly by a rather low traverse.

This is one of the many heterogeneous types that have been referred to the genus Gobius. The chief distinctive characters of the present genus repose on the pectinated scales, the approximated eyes, and the slender and scattered pharyngeal teeth. Several species of Chinese and Japanese Gobies, of which Gobius flavimanus of Temminck and Schlegel may be considered as the type, appear to be referable to this or a closely allied genus.

Ctenogobius fasciatus, Gill.

Body oblong, with dorsal and abdominal outlines straight, converging as they approach the caudal fin; anteriorly, it is thick and little compressed, the size at the pectorals being three quarters of the greatest height, which is little more than one-seventh of the entire length; the thickness gradually diminishes to the tail, which is much compressed. The head is less than a fifth of the total length, inclusive of the caudal; the eyes are more than a quarter of the length of the head, and are distant the length of one of their diameters from the snout; the space between them is only two-sevenths of an orbit's diameter. The sienna-yellow, with irregular black spots and dots near the mouth and between the eyes, and with scattered dots on the cheeks and opercular bones. A dark spot forming a triangle covers the operculum.

Order.

PHARYNGOGNATHI, MULL.

Sub-Order.

ACANTHOPTERYGII, MULL.

Family.

CHROMIDIDÆ, BONAPARTE.

Genus.

CYCHLASOMA, SWAINSON, (EMEND.)

Body oval, compressed, covered by large scales.

Head obese, with the profile triangular.

Mouth moderate, with the gape vertically elliptical; lower jaw shorter than the upper. The intermaxillaries, which alone form the arch of the upper jaw, are very protractile, and the ascending branches are as long or longer than the horizontal; when retracted their extremities reach to a point in the forehead beyond the anterior borders of the orbits.

Teeth on the intermaxillaries of the anterior row moderate, sub-cylindrical, approximated, recurved at the apices; behind these are many irregular, smaller teeth, which increase in number and size towards the symphisis of the intermaxillaries. The dentaries are provided with similar teeth, but the hinder ones near the symphisis are a little smaller than those of the outer row. Palatines, vomer, and tongue edentate.

Lips thick.

Tongue thick and rounded in front.

Lower pharyngeals united into a single equilateral, triangular bone, and covered with moderate teeth, of which the row near the posterior margin and those along the middle, extending from the anterior angle, are largest; these are laterally compressed, curved posteriorly for about two-thirds of their length, and from this point, with a bolder curve, they advance forwards; as the teeth approach the sides they lose this form, and begin to assume a subcylindrical shape with the apices hardly uncinate.

Branchial arches with the concave sides armed with compressed bony papillæ, which, on the first pair, are sometimes dilated at the extremities.

Branchiostegal rays five.

Opercular apparatus with the bones entire; operculum with a blunt spine at the angle; operculum, sub-operculum, cheeks, and the upper part of head, to within a short distance of the anterior borders of orbits, covered by large scales; the scales on the cheeks are in three or four rows.

Nares simple, between the mouth and eyes.

Lateral line interrupted; the anterior portion near the back and nearly parallel with it; the second rectilinear, running along the middle of the sides and the tail.

Ventrals triangular, with one spinous and five soft rays.

The genus which we have above characterized was first indicated under the name of Cychlasoma by Mr. William Swainson, in 1839, in his "Natural History of Fishes, Amphibians, and Reptiles, or Monocardian Animals." About a year later, Mr. Jacob Heckel published a very important Memoir on the fishes, which are comprised in the family Chromididæ. In that work he established, among other genera, one for which he used the name of Acara, a vernacular term by which some species of the genus are known in South America. Mr. Heckel embraced in this genus, those fishes which had been described by Bloch as Perca bimaculata, Labrus punctatus, and Sparus Surinamensis, and also the Chromis Nilotica of Cuvier, C. Braziliensis of Quoy and Gayward, C. taenia of Bennet, Sparus Desfontaines of Lacepede, and Lobotes ocellatus of Spix. Mr. Swainson took as the type of his genus the Labrus punctatus, and refers to the figure given by Bloch:—that species is indeed the only one mentioned by him. As it is a true Acara, the latter genus is consequently synonymous with Cychlasoma, and in accordance with the law of priority, the Swainsonian name must be adopted as that of the present genus.

The characters given by Swainson to his genus are not very satisfactory, and even incorrect in some respects. He chiefly distinguishes it from the genus for which he retains the name of Chromis, by the rounded caudal fin, and by the large pectorals, which are also rounded, assigning to Chromis a lunate caudal, and pointed pectorals and ventrals. But Swainson's Chromis is rather synonymous with Geophagus of Heckel, for the only species which are referred to it are those fishes which were described by Bloch as Labrus melanogaster and Sparus Surinamensis, the latter of which is a true Geophagus, although placed by Heckel in his genus Acara. Swainson also states, as one of the characters of Cychlasoma, that the "lateral line is abruptly bent;" this statement certainly does not convey a true impression, and is even erroneous, as the lateral line is interrupted at the posterior part of the body, towards which the anterior portion of the line is conducted in a direction nearly parallel with the back, and is abruptly discontinued at a point under the middle of the soft portion of the dorsal, or near its posterior termination, and where the constriction of the body commences. The only genus of Chromidoids possessing a lateral line, which could be correctly described as "abruptly bent," is the restricted Cychla of Bloch.

The other characters given in the diagnosis of the genus by Swainson, apply almost equally well to several other genera of Chromididæ. His name itself is also objectionable, but the law of priority renders it imperative that it should be retained.

Several species appear to have been referred by Mr. Heckel to his genus Acara, which are not congeneric with the majority of his species, or with those he first describes. The Sparus Surinamensis has been referred by Drs. Müller and Troschel to Heckel's genus Geophagus, and is even regarded by them as the same as his Geophagus megasema. The species of the Old World that have been referred to Acara, when critically ex-

Lobotes ocellatus. If it should be found, on a more critical examination, to be really distinct from Astronotus, to which it is most nearly allied, Heckel's name of ACARA might appropriately be retained as its generic name. This would be no more than an act of justice to that naturalist, who has contributed more than any other to the history of the family. The Acara crassispinis is generically distinguished from Cychlasoma by the smaller scales which cover the body, the concave forehead, and the much larger number of rows of scales which cover the cheeks, the number of rows amounting to ten. It belongs to the Section E. of the genus Acara, in the arrangement of Heckel, a section which is characterized in the words, "Bucca squamarum seriebus 10; squamis omnibus minoribus:" the other sections of his Acara are distinguished by the number of rows of buccal scales, the size of the sub-orbital, and the presence or absence of dark colored vertical bands, and all belong to Cychlasoma, as now restricted.

Cychlasoma will then include the Acara Heckelii of Müller and Troschel, Perca bimaculata and P. punctata of Bloch, and Heckel's species Acara tetramerus, viridis, diadema, vittatus, pallidus, dorsiger, marginatus, dimerus, nassa, cognata, and unicolor. Some of the fishes recently described as belonging to "Chromys," by Count Castelnau, also belong to this genus, but as he has not described the character of the pharyngeal bones or the dentition, it is difficult to refer some of his species to any established genera. His Chromys uniocellata and C. obscura appear to be species of Cychlasoma. The species which he describes and figures as "Chromys punctata? Bloch," is certainly very different from the Labrus punctatus of Bloch, and even appears to belong to another genus.

§ I.

Species with three spines to the anal fin.

Cychlasoma pulchrum, Gill.

VERNACULAR: *Cascarub.*

Body highest at the fifth and sixth dorsal spinous rays; commencement of dorsal distant three-tenths of the entire length of body from the extremity of the muzzle; the greatest height of the body is nearly one-third of the total length. The head is considerably less than a quarter of the entire length, inclusive of the caudal; the facial outline from dorsal to mouth moderately curved. Anal fin commencing under the first soft ray of the dorsal. Eleven rows of scales obliquely cross the body at its greatest height. The first part of the lateral line runs through a row of fifteen scales; the second, one of ten scales.

D. xiii.—11. A. iii.—7. C. 16. V. i. 5. P. 12.

The general color of the body and head is olive green. A

§ II.

Species with four spines to the anal fin.

Cychlasoma taenia (Bennett) Gill.

VERNACULAR: *Cascarub.*

SYNONYMY.

Chromis taenia, *Bennett*, Proceedings, &c., Zool. Soc. of London, part I., p. 112, 1830.

Acara taenia, *Heckel* (nomen) Zool. Abhandlungen aus den Annalen den Wiener Museums der Naturgescheite, vol. II. p. 361, 1841.

Chromis tæ'nia D. H. Storer, Synopsis of the Fishes of North America, page 68. Ib. in Memoirs American Academy, vol. II. p. 520, 1846.

The body is highest at the seventh spine of the dorsal, which fin commences in advance of the anterior third of the body; the greatest height of the body is more than two-fifths of the total length, inclusive of the caudal fin. The head bears a proportion to the entire length of one to three and two-thirds; its profile rapidly declines from the dorsal. Anal fin commencing under the thirteenth spine of the dorsal. The body at its greatest height is obliquely crossed by twelve rows of scales; the anterior portion of the lateral line is contained in a row of seventeen scales, and the posterior in one of ten.

D. xv.—10. A. iv.—9. C. 16. V. i.—5. P. 12.

Color of head dark olive green, tinged with yellow. Body olive green, crossed by seven to nine obscure dusky bands, and with as many longitudinal interrupted stripes along the sides as there are rows of scales. A nearly round black spot is on each side on the fourth and fifth rows of scales in an oblique line from the back, and below the eighth, ninth, and tenth dorsal spines; two other spots, which are sometimes merged into one, precede it. The pectorals are yellow. An infraorbital black spot is present.

This species of Acara was first indicated under the name of Chromis taenia by Mr. E. T. Bennett, who described it from specimens in a small collection formed during a voyage of H. M. S. Chanticleer. This notice is in Latin, and is confined to a description of the color and of the radial formula. He gives as its *habitat* the island of Trinidad. Subsequently Dr. David H. Storer gave a translation of this description in an appendix to his "Synopsis of the Fishes of North America," originally published by the American Academy of Arts and Sciences, in the third volume of their new series of "Memoirs."

This fish is in that memoir said to be found in the Caribbean sea *on the authority of Mr. Bennett*, although that naturalist had simply stated that it was found in Trinidad ("apud Trinidad"). The learned ichthyologist of Boston, who appears to have been unacquainted with Dr. Heckel's memoir on these and the allied genera of fishes, was probably misled by the knowledge that some of the species of the genus

Mouth moderate with the gape oval. Lower jaw longer than the upper. The intermaxillaries alone form the edge of the upper jaw, and are very protractile; their ascending branches are longer than the horizontal, and when retracted, reach to a line posterior to the centre of the orbits.

Teeth on the intermaxillaries in an anterior row, moderate, subcylindrical, and recurved near the summits; behind these are one or two irregular rows of smaller ones. Dentary with similar teeth. Palatines, vomer, and tongue naked.

Lips thin.

Tongue rather thin, long.

Lower pharyngeals forming an equilateral triangle, covered with teeth, of which those near the posterior margin and along the middle are largest, compressed, and with the summits scarcely uncinate; the lateral teeth are much smaller.

Branchial arches with the concave sides provided with bony, compressed, scabrous papillæ.

Branchiostegal rays five.

Preoperculum with the posterior margin serrated; operculum with an obtuse spine.

Operculum, preoperculum, and the head above, as far as the eyes, covered with scales similar to those of the body.

Nares simple, near the mouth.

Lateral line interrupted; both portions rectilinear.

Dorsal commencing above the base of the ventrals, and extending along the entire length of the back; the spinous portion is long, low, and subequal, the soft portion hardly half the length of the spinous, but much higher, especially the middle rays, which are considerably produced beyond the membrane.

Anal commencing under soft portion of dorsal, and terminating at the same distance, supported by three spinous rays. Soft portion with the median and posterior rays produced.

The bases of both these fins are destitute of scales.

Caudal with the base covered by scales; the margin rounded.

Ventrals triangular, with one spinous and five soft rays.
Pectorals moderate, rounded.

We accept this genus with the same limits as have been given to it by Mr. Heckel.

Crenicichla frenata, Gill.

VERNACULAR: *Brochet.*

The back from the nape to the posterior third of the dorsal fin is straight; from the latter point, it obliquely descends to the end of the fin, and thence again advances in a straight line to the caudal. The frontal outline from the dorsal fin to the snout descends very gradually, and as far as the eyes, in a slight curve. The head forms two-sevenths of the entire length, inclusive of the caudal fin. The distance from the mouth to the origin of the dorsal is only a quarter of the total length, and exceeds by more than a third the height of the body at the latter point. There are seven series of buccal scales. The anterior portion of the lateral line runs through about twenty-metallic yellow spots is painted on the side along the anterior portion of the lateral line, and extends to the caudal; a second row also adorns the sides on a line with the posterior portion.

The dorsal and anal have oblique dusky bands; ventrals and pectorals whitish.

This species is most closely allied to the Perca saxatilis of Bloch, or the Crenicichla saxatilis of Heckel.

Order.

MALACOPTERYGII, CUVIER.

Sub-order.

ABDOMINALES, CUVIER.

Family.

SILUROIDÆ, CUVIER.

Sub-family.

PIMELODINÆ, BONAPARTE.

Genus.

PIMELENOTUS,* GILL.

Body entirely naked, oblong, slightly compressed or subcylindrical anteriorly, and becoming more and more compressed as it approaches the caudal.

Head slightly compressed laterally, with the profile subconical; moderately broad above, narrowing very gradually to the muzzle; the posterior prolongation of the interparietal nearly reaches to the buckler, but is not continuous or united with it; the bones are covered by a thin, tense, and smooth skin, through which the sculpture or wrinkles of the casque are apparent.

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* Πιμελη, fat, and Νωτος, back, in allusion to the long adipose dorsal.

Mouth with the gape moderate, and nearly square; the intermaxillaries are slightly arched; the maxillaries continued into long and simple barbles; from the skin behind the lower jaw are also suspended two pair of barbles.

Teeth equal and villiform in broad bands on both the intermaxillaries and the dentaries.

Tongue thick and large, rounded in front, and attached by the margin to the skin of the floor of the mouth.

Lateral line extending in nearly a straight line along the middle of the side to the caudal.

First dorsal with the height and length nearly equal, situated on the anterior part of the body; its first ray is generally slender, and not dentated. Second or adipose dorsal very long, compressed, attached for its entire length to the back, with the margin generally trenchant, and with the height increasing towards the posterior half.

Anal short, and with the length and height almost equal, placed nearly under the middle of the adipose dorsal.

Caudal forked.

Pectorals moderate, with the first soft rays longest.

Even in the section so restricted, there appear to be embraced several genera, which we may at a future time name and characterize. Müller and Troschel have already separated, under the name of Calophysus, a most distinct genus, the typical species of which was formerly placed in this group by M. Agassiz, in the "Selecta Genera et Species Piscium," of Spix, and by M. Valenciennes in the "Histoire Naturelle des Poissons."

The "preceding" species to which Valenciennes alludes in the paragraph which we have above cited, form a third section in his arrangement; they are distinguished by the round and smooth head; and the presence of only six barbles, the nasal ones being absent. Two or more genera seem to be also embraced in the section. The type, P. raninus, Val., belongs to a new genus, which we call BATROCHOGLANIS. The species which constitute this genus have an aspect nearly similar to the North American Pimelodus, but their body is even shorter and stouter than in that genus, and the anal, as in almost all of the South American Pimelodinæ, is much shorter, and only supported by from eight or nine to fourteen rays. The caudal is either rounded or emarginate, and the adipose fin small. Batrochoglanis will include the Pimelodus raninus of Val. as its type, and as additional species P. bufonius, Val., P. mangurus, Val., and P. charus, Val.

The fish which Lacepede has indicated as the Tachisurus Chinensis, from Chinese drawings, appears to be also the type of a distinct genus, but as we have never been able to examine it, we are not able to give its characters.

Another genus which was placed by Valenciennes, in a fifth section of Pimelodus, but which appears to have very little real affinity to any other genera of Pimelodinæ, has recently received from M. Dumeril the name of Conostoma. After the separation from Pimelodus of these natural genera, and several others that have been founded by naturalists, the genus to which the name of Pimelodus should be restricted, deprived of the numerous species with which it has little affinity, is almost exclusively confined to the North American continent. The Asiatic species, which have been referred by M. Valenciennes to his first section of Pimelodus, appear to form a distinct genus, but are only known by imperfect and very unsatisfactory descriptions, and most of them have never been seen by naturalists, the descriptions having been drawn up simply from inspection of Chinese figures. One of these Asiatic species, which has long been known by a brief description and figure given by Russel in his "History of Aleppo," and which has received from Linnæus, the name of Silurus cous, proves not to belong to the genus. Valenciennes, who had only the work of Russel as original authority, referred it to Pimelodus with doubt. The species has recently been re-discovered, and has been placed by Mr. Heckel in the genus Arius, in his memoir on the Syrian Fish, obtained by Russegger. There have been still further separated from Pimelodus, the Noturus of Rafinesque, which is confined to North America, the Calophysus of Müller and Troschel, peculiar to South America, and the Asiatic genus, Bagarius of Bleeker. The Tachisurus of Lacepede, will also probably be found, when properly restricted, described by Drs. Müller and Troschel are the P. Sellonis, P. Stegelichii, and P. Deppei. It is the P. Deppei that we have alluded to in our remarks on the geographical distribution of the genus, as being the only species that has been discovered beyond the boundaries of the South American zoological province; that species, according to Drs. Müller and Troschel, was brought by the gentleman to whom it was dedicated, M. F. Deppe, from the Sandwich Islands, but from what particular island we are unfortunately not informed. The discovery of a representative of this group in those Islands is most interesting, and we may well look forward to the time when our knowledge of their fresh water fishes will be increased, as an archipelago that has contributed to the malacologist so many species of most interesting genera peculiar to the Islands, will doubtless afford some interesting ichthyic novelties.

Pimelotus Vilsoni, Gill.

VERNACULAR: *Catfish; Barbe.*

This species is one of the most slender of the genus. Of the entire length from the snout to the termination of the lobes of the caudal fin, the head to the end of the operculum bears a proportion of only one to about five and two thirds; the visible portion of the posterior projection of the interparietal of Cuvier and Valenciennes, or the supra-occipital of Owen, extends a very short distance beyond the operculum. The cranium is irregularly wrinkled, the wrinkles becoming more prominent, posteriorly. The anterior "fontanelle," or "solution of continuity," is elongated and narrow, extending from a point on a line between the inner angles of the maxillary barbles, as far back as the posterior borders of the orbits. The eyes are large and longitudinally oval, and the longitudinal diameters are contained between four and five times in the length of the head, from the snout to the margin of the operculum. Less than one and a half of these diameters separates the eyes from each other, and the same distance intervenes between them and the muzzle. The superior nasal openings are very small, and nearly equidistant between the anterior borders of the orbits and the muzzle. The upper jaw is shorter than the lower. The maxillary barbles reach as far back as the end of the anal, and often even to the tail. The opercula are radiatedly striated. The pectoral spine is rather slender, shorter than the first soft ray, and generally denticulated along the whole of its internal border, and on its external one towards the extremity. The first dorsal ray is a very slender spine, which is sheathed in a membrane that extends much beyond the spine itself. The ventrals are nearly under the dorsal's posterior ray. The caudal is unequally forked, and its lower lobe is larger, and has its margin rounded.

The radial formnla, inclusive of the rudimentary rays, may be rendered as follows:

D. I. 6. A. 10. C. 3. I. 5. 4. I. 10. P. I. 8. V. 6.

The color of the upper regions of the body is brown; beneath it is pearly. The caudal, anal, ventral, and pectoral fins are

Subfamily.

CALLICHTHYINÆ, BONAPARTE.

Genus.

CALLICHTHYS, LINN. (EMEND.)

Body oblong, compressed, with the dorsal and abdominal outlines nearly rectilinear and parallel; the median line of the back behind the first dorsal is bare, or sometimes covered by small and irregular plates.

Head broad and much depressed: interparietal plate with the breadth and length nearly equal, and with the posterior extension short and obtuse. Nuchal plates with their internal borders contiguous for the entire or greater part of their length, and each of a sub-triangular form, with the posterior margin rounded and parallel, or nearly so, with the dorso-lateral plates which succeed them on the body.

Eyes very small.

Mouth small, with the gape sub-circular. Jaws nearly equal, or with the upper slightly projecting when the mouth is closed.

Teeth on the dentaries very small, compressed, and recurved. The intermaxillaries and vomer appear to be edentate.

Lips thin, covering the jaws, the lower forming a membranous veil reflected backwards and emarginate. Each angle of the mouth is furnished with a double barble, whose branches are only united at the base.

Branchiostegal membrane supported by three moderate rays, and a small or rudimentary one.

First dorsal subquadrate, above the ventrals.

Second dorsal above the anal, and consisting of a single spine or spiniform plate, which sustains a slender membrane representing the adipose fin of the Pimelodinæ; this spine is preceded by several small plates.

Anal short.

Caudal with the margin rounded.

Ventrals with the margins rounded; the first rays are spinous.

Humeral plates anteriorly approximated to each other on the breast, and with the internal sides receding from each other in opposite directions, in such a manner as to leave the breast perfectly unprotected posteriorly; these plates are curved backwards behind the pectoral fins, and are prolonged behind into a triangular spine, from the angle of which they advance obliquely upwards and forwards to the mastoid plates.

Callichthys, as we have now limited it, will only include the species of the old genus with naked breasts. The species now known are C. asper, Val., C. læviceps, Val., if distinct from the preceding, C. exaratus, Mull. and Troschel, and C. cælatus, Val. The C. pictus of Mull. and Troschel appears to be also referable to this genus.

Callichthys Kneri, Gill.

VERNACULAR; *Cascadura.*

The color is a brownish black, with a darker line along the length of each plate. The naked skin of the abdomen is slightly tinged with purple. The rays of the caudal fin are barred with brownish black.

It attains a length of about four inches.

We have taken pleasure in dedicating this species to Prof. Rudolph Kner, who has contributed much to our knowledge of the Callichthyinæ, and other groups of Siluroids.

Genus.

HOPLOSTERNUM, GILL.

Body oblong, compressed, with the dorsal and abdominal outlines nearly straight and parallel; the median line of the back behind the first dorsal is naked, or protected by small plates.

Head broad, and moderately depressed. The interparietal plate is little, if any, broader than long, and its posterior prolongation is short and obtuse; nuchal plates broad, contiguous along the median line for the greater portion of their length.

Eyes moderate.

Mouth small, with the gape subcircular; the upper jaw is little longer than the lower. The intermaxillaries, dentaries, and vomer are destitute of perceptible teeth.

Lips thin; the lower is reflected backwards, and emarginated in the middle; at each angle of the mouth, there is a double barble as in *Callichthys.*

Branchiostegal membrane consisting of three moderate rays, and a small rudimentary one.

Dorsals and anal with the same form and situation as in the genus *Callichthys.*

Caudal emarginate, or occasionally slightly rounded.

Ventrals with rounded margins.

Humeral plates anteriorly, either simply contiguous or interlocking with each other on the breast; the internal borders recede from each other at an angle less than a right angle, and are extended backwards for some distancė, when they are terminated by a more or less rounded angle, from which they advance obliquely upwards and forwards to the mastoid plates; the sides of the breast are thus protected by these plates, and the interval or bare skin of the breast between them, is of a more or less elongated triangular form.

This genus is framed for the species of Callichthyinæ with the head depressed, and with the breast protected by the humerals. The Callichthys lævigatus of Valenciennes, of which the C. subulatus of the same author is the male, may be considered as its type. The remaining species are C. littoralis of Hancock, which appears to be distinct from C. lævigatus, C. albidus, Val., C. chiquitos, Castelnau, C. thoracatus, Val., and C. longifilis, Val. The C. personatus of Ranzani, and C. sulcatus of Kner, appear to be synonymous with the latter species.

Hoplosternum laevigatum, (Val.) Gill.

VERNACULAR; *Cascadura.*

slight curve, to the snout; this curve is boldest between the interparietal projection and the dorsal spine; from the former point to the snout, it is nearly straight. The whole surface of the casque is pitted; the indentations are generally more numerous and approximated on the anterior plâtes, than on the posterior ones; and are there separated from each other only by the broad and elevated lines of the surface, which, by their frequent intersection, give a coarsely reticulated appearance to the casque. The interspace between the interior margins of the anterior frontals, or the "solution of continuity" of Valenciennes, is generally large, of an ovate-fusiform shape, and extends from the anterior angle of the interparietal, (where it is sometimes slightly rounded, the interparietal being proportionally emarginated, or truncated) to within a short distance of the bare skin of the muzzle, from which it is generally separated by the intervention of a small sub-triangular plate, whose apex is posterior. Occasionally this plate is absent, and the bare skin of the muzzle is continuous with that of the interval between the frontals; this interval is also variable in its proportional length, sometimes being thrice as long as it is wide, and at other times not more than twice its width. The eyes are circular and of moderate size, the diameters of the orbits forming about a sixth of the entire length of the head; they are separated from each other by about three and a half, and are at a distance from the snout of about two and a half diameters.

This description applies equally to the males and the females. We now proceed to describe the sexual characters and differences; these are chiefly manifested exteriorly in the spines of the pectorals, and have afforded to Valenciennes the characters which distinguish two of his nominal species, the *Callichthys laevigatus*, and the *C. subulatus*.

In the males, or those described by Valenciennes as *Callichthys subulatus*, the spines of the pectoral fins are stout; externally, and on the superior borders, they are covered by rasp-like asperities; internally, they are nearly smooth; a smooth space is also on the exterior sides, which extends across the greater portion of the width of the base, and thence gradually decreases towards the middle of the spine; the internal border is serrated for the third or half of its length, commencing at the base; the length of each spine is generally contained about four times and a half in the extreme length of the fish. The genital papilla is about a third of the length of the ventral fin.

The female has been described under the name of *Callichthys laevigatus;* in this sex, the spines of the pectorals are for the most part smooth on both sides, but covered on the superior borders with rasp-like asperitics as in the male; the interior borders are strongly serrated for almost the entire length; these spines are never recurved at their apices, but nearly straight for the entire length, or very slightly curved inwards; they are also generally shorter than those of the males, although the length varies, being sometimes nearly a fifth of the entire length, while in other individuals, as in those described by Valenciennes, they are contained as much as six times and a half in the extreme length of the body. The genital papilla is much shorter than in the male.

D. I. 7. A. 8. C. I. 6. 6. I. V. 6. P. I. 8.

channel connecting the bare skin of the muzzle with that of the "fontanelle," belonged to a distinct species, especially as those differences were accompanied by rather smaller size, and longer pectoral spines. On a closer examination of other individuals, we found that the plate varied greatly in size, and that in some, in which the channel hardly existed, it was obsolete. The pectoral spines were also found to vary in length in specimens that were otherwise identical. We have, therefore, concluded to regard the two specimens with those characters as only forming a variety.

The Callichthys lævigatus of Valenciennes appears to have been first figured in the great "Atlas du Voyage dans l'Amerique Meridionale" of M. D'Orbigny. As Dr. Kner has already observed, the figure given represents a female. On a comparison of specimens of the Trinidad fish with that figure, a difference is observed in the form of the operculum, and in the caudal plates; but as the figure does not appear to have been drawn with much attention to the minute details, we do not venture to separate the two on such evidence, after the positive assertion of Valenciennes. In the figure of the species of Buenos Ayres, the operculum is represented as having the border slightly emarginate, while in the fish of Trinidad, it is nearly straight; the caudal plates are also represented as being quite angular posteriorly in the figure of D'Orbigny; in the Trinidad species they are more rounded. Little reliance, however, is to be placed in the latter character, as the caudal plates are subject to considerable variation. Still greater differences are perceptible in the forms of the mastoids, and both pairs of frontals; but the design of the former appears to have been an error of the draughtsman.

Subsequently, M. Valenciennes, in his continuation of the "Histoire Naturelle des Poissons," described this species, and referred to the figure in the "Atlas" of M. D'Orbigny. In this work he stated that he had received it from Buenos Ayres, through M. D'Orbigny, and from Trinidad, through M. Robin.

The distance between those two places is so great, that it appears hardly possible that the same species occurs at both points. We have, consequently, only given in the synonymy reference to the "Histoire Naturelle des Poissons," in which it is said to inhabit Trinidad; as the figure of M. D'Orbigny, only represents the fish found in Buenos Ayres, we have omitted to refer to it.

At a later date, Dr. R. Kner published (in the seventeenth volume of the "Sitzungsberichte der Mathematisch-naturwissenschaftlichen Classe der kaiserlichen Akademie der Wissenschaften," for June, 1855), "Ichthyologische Beiträge," containing descriptions, among other Siluroids, of the species of Callichthys preserved in the Museum of the Academy. In that memoir he described the C. lævigatus Val., and drew attention to the fact that the species, as described in the "Histoire Naturelle des Poissons," and figured in the Atlas of D'Orbigny's voyage, was a female, and that the C. subulatus of Val. would probably prove to be a male of the same species. Dr. Kner does not positively state the place from which his specimens of C. lævigatus were procured.

necessary to regard the Trinidad fish as a distinct species, the name of *H. sapidissimum* may be given, in allusion to the esteem in which it is held in the island as an article of food.

Hoplosternum Stevardii, Gill.

VERNACULAR: *Cascadura.*

This species is very closely allied to the Hoplosternum lævigatum, but the description which we proceed to furnish will prove that it is quite distinct.

It attains a larger size than the preceding; the two males which are in our possession being between eight and nine inches in length from the muzzle, to the ends of the lobes of the caudal fin; in this length, the head is contained about four times and two-thirds, and is slightly shorter than the body is high at the dorsal spine: the profile slopes with a slight but continuous curve from this point to the snout. The entire surface of the casque is very closely pitted, and the raised lines between them form a coarse network. These pits are also finely granulated, and the surface thus assumes, when viewed under a magnifier, an appearance slightly resembling that of the brain coral (*Meandrina*). The naked interspace between the anterior frontals, or the "solution of continuity," is of an oval form, and is shorter and broader than in *Hoplosternum lævigatum;* it extends for about three-quarters of the distance of the inner margins of the frontal plates, terminating posteriorly at the interparietal, the anterior angle of which plate is slightly truncated; anteriorly, this interspace is rounded; the anterior azygous triangular plate between the anterior frontals is of moderate size.

The eyes appear to be smaller than in the *Hoplosternum lævigatum*, the diameters of the orbits being rather less than a seventh of the entire length of the head from the snout to the margin of the operculum; the space that intervenes between them is equal to about four and a half of their diameters, and that which separates them from the muzzle equals three and a third diameters.

In the males, the spines are robust, compressed, and contained between four and a half and five times in the extreme length of the body; they are recurved at their extremities, and the external sides and superior border, as well as the superior half of the internal sides, are covered by rasp-like asperities; at the base of the spine on the external side, there is an elongated triangular smooth space, and the lower portion of the internal side is also smooth; the internal border is entire, and not serrated.

The female of this species has never been seen by us.

The radial formula is nearly the same as in the *Hoplosternum lævigatum.*

D. I. 8—I. A. I. 6. C. I. 6. 6. 1. V. 6. P. I. 9.

The color, as in the preceding species, is olive brown above, with a tinge of purple on the skin of the abdomen.

Genus.

one is reflected backwards, and emarginated in the middle, and the angles on each side of this emargination are generally protracted into two short barbles. A double barble, which is a prolongation of the maxillary, is present at each angle of the mouth, as in *Callichthys*, and *Hoplosternum*.

First dorsal quadrangular, and opposite the ventrals.

Second dorsal, a small adipose fin sustained by a single spine, which is preceded by several azygous plates.

Caudal forked.

Pectorals rounded.

Ventrals subtriangular.

Humeral plates as in *Hoplosternnm*, anteriorly contiguous, and with the internal borders abruptly departing from each other at less than a right angle, and leaving the bare skin of the abdomen between their borders of a semi-elliptical form.

Anus a short distance posterior to the base of the ventrals.

This genus was first established in 1839, by William Swainson, in the work* that we have before had occasion to refer to; the name is in that work incorrectly written Hoplisoma. The genus was framed for the reception of the Cataphractus punctatus of Bloch, which was the only species known at that time. Since then, several species have been added by different zoologists. Those at present known are Hoplosoma paleatum, or the Callichthys paleatus of Jenyns, and the H. splendens and H. taiosh, which were likewise described by Count Castelnau as species of Callichthys. We now add a species from Trinidad very nearly allied to that described by Jenyns.

Hoplosoma æneum, Gill.

VERNACULAR: *Cascadura.*

Body oblong, highest at the spinous ray of the first dorsal fin, from which the dorsal outline slopes in nearly a straight line to the caudal; the greatest height is rather less than a fifth of the total length, inclusive of the caudal, and is two and a half times greater than the height at the end of the tail. The head, from the muzzle to the margin of the operculum, is contained three and two fifth times in the length from the muzzle to the base of the caudal, and five times in the entire length, including the caudal fin. The eyes are about two-ninths of the length of the head, and are distant more than two diameters from each other, and still further from the muzzle.

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* The Natural History of Fishes, Amphibians and Reptiles, or Monocardian Animals, vol. i., p. 336, and vol. ii., pp. 189, 304.

The first dorsal commences at a distance from the snout, exceeding one and two thirds of the head's length; its base equals three diameters of the eye, and the distance between its last ray, and the spine of the adipose fin, is less than four diameters.

D. I. 7—1. A. I. 6. C. I. 6, 6, I. V. 6. P. I. 7.

The head and dorso-lateral plates are of a deep bronze color; the ventral plates yellowish. All of the fins are immaculate. The operculum, and the humeral and nuchal plates are of an iridescent blue color.

Family.

GONIODONTES, AGASSIZ.

Sub-family.

HYPOSTOMINÆ, GILL.

Genus.

HYPOSTOMUS, LACEPEDE, KNER.

Body oblong and moderate, sub-angular, covered by several rows of high, imbricated plates, which are more or less pectinated posteriorly. Abdomen covered with very small granulated plates.

Head large, broader than the body, depressed, with the vertical aspect semi-oval, and with the eyes oblique, and visible from above. Branchial apertures advanced far forwards, and under the eyes. Interopercula with the margins simply pectinated or dentated.

Mouth moderate, with the labial veil semicircular and entire, straight and narrow in front, with broad and rounded margin behind, and with the whole of the inferior surface studded with papillæ; opposite the angles of the mouth, a small tentacle is often continued from each side of the veil.

Teeth rather short, slender, curved, and with hooked apices.

First dorsal subquadrate, placed over the bases of the ventrals, and rather higher than long.

Anal small, composed of one simple and four or five soft rays, placed a short distance behind the anus, and between the first and second dorsals, or under the last rays of the former.

Caudal forked or lunate; the lobes nearly equal, or the lower slightly longer than the upper.

Pectoral large, with the first ray a large and robust clavate spine, beset with villiform teeth.

Ventrals moderate, with the first ray simple, large, cartilaginous, and flexible, and with asperities similar to those on the pectorals.

Hypostomus Robinii, Val.

VERNACULAR: *Tata.*

SYNONYMY.

H. Robinii, Cuv. and Val. Hist. Nat. des Poissons, vol. xv., p. 500, 1840.

The body behind the head is slender, and has four longitudinal carinæ above, of which the two superior run along the row of plates on each side of the dorsal, leaving the back between them flattened; of the remaining two, one runs on each side along the centres of the second row of plates. Another carina is formed by the angles of the fourth row, and is very distinct anterior to the ventral, and obsolete behind it.

The head from the muzzle to the nape is about two-ninths of the entire length of the body, inclusive of the caudal; but excluding that fin, it bears a proportion to the body of one to three and a fifth. The width of the head at the base of the pectorals is considerably less than its length; the anterior por-coalesce, forming a single row of large spots. Pectorals and ventrals with single rows of spots between the rays.

It attains a length of six to nine inches, and is occasionally found a foot in length.

A single dried individual of this species was brought from Trinidad by M. Robin, and served for the description of that species by M. Valenciennes. Other but smaller specimens have been brought from the tributaries of the Rio de la Plata by M. D'Orbigny, which M. Valenciennes was unable to distinguish from the species of Trinidad. M. Valenciennes describes the interparietal plate as being destitute of a crest, but with a slight convexity, and places it at the head of a section, composed of species in which the angles and crests are nearly obsolete, and the head and body become gradually depressed. No mention is made of the blunt and obsolete ridges and elevations noticed in the above description, but as our specimens are from the same place as the one described by the French ichthyologist, and agree in other respects, there can be no doubt that they belong to the same species.

If this fish has been correctly identified as belonging to the same species as that found in the affluents of the La Plata, it has certainly a most extensive range.

Genus.

ANCISTRUS, KNER. (EMEND.)

Trunk slender and moderate, covered by several rows of high and oblique, regularly imbricated plates, whose free margins are pectinated. Skin of abdomen entirely naked and smooth.

Head large, ovate, triangular, broader than the body. Interparietal with the breadth and length nearly equal. Eyes moderate. Branchial apertures under the eyes.

Interoperculum movable, and armed with a tuft of rather long and slender spines, with hooked apices; this tuft is nearly concealed in a fossette under the operculum when it is depressed.

Mouth moderate, with the labial veil semi-ovate and entire, narrow and nearly straight in front, broad and with a rounded margin behind; the inferior surface of the veil is covered by conical papillæ.

Teeth slender with hooked apices.

First dorsal sub-quadrate, little longer than high, and generally supported by eight rays; its anterior portion, or the middle, is placed opposite the bases of the ventrals.

Anal small, consisting of from three to six rays.

Pectorals large, with the first rays robust, and covered with prickly spines.

Ventrals moderate, with the first rays claviform, as in the pectorals, but much more slender.

As we have above restricted the genus Ancistrus, the Hypostomus duodecimalis of Valenciennes, and H. multiradiatus of Hancock will be excluded. For those and the allied species

Ancistrus guacharote (Val.), Gill.

SYNONYMY.

Hypostomus guacharote, Cuv. and Val. Hist. Nat. des Poissons, vol. xv., p. 508. 1840.

The body is moderately slender. The head from the muzzle to the nape forms a quarter of the entire length, inclusive of the caudal, and a third of the length to the base of that fin; at the opercular bones or bases of the pectorals, it is as broad as long; on the posterior portion, it is flattened above, and rounded on the sides, without any crests or sharp angles. The eyes have diameters equal to a fifth of the length of the head; the distance between them is equal to two and a half diameters, and is little less than their distance from the snout. The anterior angle of the branchial aperture is under the fore part of the eye.

The first dorsal commences at a distance from the snout, equal to double the length of the head; its base exceeds the interval between the eyes, and is three-fifths of the greatest height; the distance between its last ray, and the spine of the adipose dorsal, is equal to half the length of the base of the first dorsal.

D. I. 7—I. A. 4. C. I. 6, 8 I. P. 1, 6. V. 1, 5.

The color of the body and fins is a reddish brown; the body is immaculate; the fins clouded with a darker color.

The description which Valenciennes has given of the Hypostomus guacharote answers in every particular to the species inhabiting the waters of Trinidad. The specimens, from which that ichthyologist drew his description, were brought from the island of Porto Rico by M. Plée. The specific name given to the species is the same as the popular one by which it is known in that island. It appears to be rather rare in Trinidad; the vernacular name by which it is there called is *Tata*, the same as that given to the Hypostomus Robinii, Val. It attains a length of four or five inches.

Family.

ERYTHRINIDÆ, VALENCIENNES.

Sub-family.

ERYTHRININÆ, GILL.

Genus.

MACRODON, MULL.

Body oblong, compressed, covered by large scales; the dorsal and abdominal outlines are but slightly convex, and the former is sometimes rectilinear.

Head large, compressed, with an obtusely rounded muzzle; there is only one supratemporal between the fifth sub-orbital plate and the cranium.

Mouth large, with the gape elliptical and wide. The jaws sides of this row are the villiform teeth on the palatine plates; two small immovable plates, which appear to be detached from the larger ones, on account of the elasticity of the osseous peduncles which bear them, are also covered with villiform teeth.

Lateral line running in a straight line to the caudal fin.

Branchiostegal rays five, flat, and broad.

Dorsal subquadrate, with the height and length nearly equal, placed nearly in the middle of the body.

Anal posterior, with the height and length nearly equal, and with the margin arched, the rays increasing in length towards the middle or posterior third.

Caudal covered at the base by scales, and with a rounded margin.

Ventrals and *pectorals* of moderate size, and with rounded margins.

In the description of the dentition of this and of the succeeding genus, we have followed M. Valenciennes.

Macrodon ferox, Gill.

VERNACULAR: *Yarrow.*

Body moderate, compressed, with the dorsal outline straight, and the abdomen arched. The head is compressed, elongated, and from the snout to the opercular margin, constitutes a quarter of the entire length, inclusive of the caudal; the eyes have diameters which nearly equal a fifth of the length of the head; they are separated from each other by a space equal to seven-sixths of a diameter, and are nearly as far distant from the snout. The height of the body is considerably less than a sixth of the entire length; the thickness is three fifths of the height. The ventrals are considerably in advance of the centre of the body, and under the anterior third of the dorsal. Twelve rows of scales cross the body, and the lateral line runs through about forty.

D. 14. A. 11. C. 17. P. 10. V. 8.

The back and sides are purplish brown; the abdomen whitish. The rays of the dorsal are spotted with from four to six blotches, of the color of the body, which also stain the membrane on each side; between the blotches, the rays are yellow; the remainder of the fin is immaculate. The rays of the caudal are yellow, interrupted by from five to seven irregular broad bands of the color of the body, which are also continued on the membrane. Anal pearly, crossed by about four purplish-brown bands; the ventrals and pectorals have the same distribution of color as the dorsal.

This species is most closely allied to M. tareira, Val., differing chiefly in the absence of the ruddy or yellow spots distributed on the back and sides of that species, and in the different color of the fins; the Trinidad species is also more slender in its proportions than the M. tareira, and its eyes are larger.

two of the middle ones pass beyond the others. Those on the palatines and pterygoids are all equal and villiform; the latter bones are continued along the internal border of the former, and constitute the arched plate of the palate, separated in the middle, from that of the opposite side, by the smooth vomer.

Lateral line running in a straight direction to the caudal fin.

Branchiostegal rays five, broad.

Dorsal with the height and length nearly equal.

Anal between the posterior portion of the dorsal, and the base of the caudal; its height and length are nearly equal, and its margin rounded.

Caudal with the base covered by scales, and with a rounded margin.

Ventrals and *Pectorals* moderate, and with rounded margins.

Erythrinus cinereus, Gill.

VERNACULAR: *Waubeen.*

Body thick and stout, the total length, inclusive of the caudal, rather less than five times as great as the height, and four and a half times greater than the length of the broad and short head. The eyes, less than one seventh of the head's length, are separated from each other by a space little less than three of their diameters, and are distant from the snout nearly two diameters. The distance of the dorsal from the snout is more than double the length of the head. The body is crossed by ten rows of scales, and thirty-five are perforated by the lateral line.

D. 10. A. 11. C. 16. P. 15. V. 8.

The color is ash, lighter on the abdomen; the dorsal has about four rows of dusky spots between the rays; all the other fins are immaculate.

Family.

CHARACINIDÆ, MULLER.

Sub-family.

TETRAGONOPTERINÆ, GILL.

Genus.

PŒCILURICHTHYS, GILL.

Body oval, compressed, and with the abdomen rounded, the whole covered by moderate scales.

Head with the profile triangular; cheeks covered entirely by the large third suborbital plate.

Mouth moderate, with the gape elliptical; lower jaw shorter than the upper. The intermaxillaries form the upper part of the arch of the upper jaw, and are immovable.

Teeth in two rows on the intermaxillaries, and in one row on the dentaries; they are wide, compressed, increasing to the

Caudal forked, with the lobes of equal size.
Pectorals moderate, with the external rays longest.

The species of this genus have been included by all previous naturalists, who have had occasion to treat of the family to which they belong, under the group which has received from Artedi the generic name of Tetragonopterus. Valenciennes had, indeed, in the Histoire Naturelle des Poissons, observed that his attention had been arrested by the great difference of form which existed between these fishes, and those species for which the Artedian genus was originally chiefly instituted; but as the variation of form was unaccompanied by any corresponding anatomical characters, he did not deem it advisable to elevate the section to the rank of a genus.

We, however, believe, that so great a variation in form as that which exists between the species of the first and second sections of Valenciennes, even if unaccompanied by any other difference, is of generic value; and we have therefore separated them into two distinct genera, retaining Tetragonopterus as the generic name of the rhomboidal, or sub-orbicular species, and to the elongated oval species we give the name of Pœcilurichthys, in allusion to the bands or spots which are almost always branded on the tail. We derive the name from the Greek Ποικιλος, variegated, Ουρα, tail, and Ιχθυς, fish; it is therefore sufficiently distinct in signification, as well as in sound, from Pœcilichthys of Agassiz.

Another group, which is represented in the island of Trinidad, has the lateral line abruptly terminated at a considerable distance from the caudal fin; in other respects it has the greatest affinity to Poecilurichthys, having, like the typical species of that genus, two rows of cuspidate teeth in the upper jaw, and one in the lower. We have not been able to study it with much care, as we have only two specimens of a single species, but when it has been dissected, and the pharyngeal bones examined, it will in all probability be found to present additional characters, which will distinguish it from Poecilurichthys proper. The tail is without the large spot which is found in almost every species, not only of that genus, but of almost every other Characin found in South America, or its zoological dependencies.

This group we have provisionally only elevated to the rank of a sub-genus, which we have called Hemigrammus,* intending by that name to allude to the lateral line, which does not traverse more than half of the length of the side.

In the genus Poecilurichthys, most of the species which have been described by Valenciennes as belonging to the second section of Tetragonopterus, will be included. These are Poecilurichthys Linnaei, P. taeniatus, first described by Jenyns, P. grandisquamis, or Tetragonopterus grandisquamis, of MM. Muller and Troschel, P. Orbignyanus, described by M. Valenciennes, P. fasciatus, first described as a Chalceus by M. Cuvier, P. scabripinnis, described by Jenyns, P. Peruanus, a species of Muller and Troschel, and P. Wappi, first described by Valenciennes. There are four other species which have been referred by the great ichthyologist of France to his second

Sub-genus.

POECILURICHTHYS, GILL.

Lateral line continued to the caudal fin.

Pœcilurichthys Brevoortii, Gill.

VERNACULAR: *Sardine.*

Body oval, with the head forming little more than one-fifth of the entire length, inclusive of the caudal fin. The eyes are large, their width being slightly less than a third of the head's length; the distance between their anterior borders and the snout is more than two-thirds of one of their diameters, and twice that space intervenes between them. The dorsal commences at a distance from the snout equal to double the length of the head; the greatest height of the body is equal to one-third of the entire length. The ventrals do not reach the anal; the tips of the pectorals barely extend to the bases of the ventrals. There are no markings on the operculum. The body is crossed by fifteen rows of scales.

D. 11. A. 29. C. I. 9. 8. I. P. 13. V. 8.

The back and upper part of the body are of a pale yellowish green color, which is separated from the lighter hue of the lower portion, by an obscure silvery band, extending from the upper angle of the operculum to the caudal fin. There is a very distinct black spot on each shoulder, a little above the oblique portion of the lateral line, and another on the tail, which often advances along the middle rays of the caudal to the margin of that fin, terminating in a point; the anterior portions of the pectorals, and the anal, are bright orange. The opercular bones are silvery.

This is the largest of the Trinidad species of this genus, and reaches a length of between five and six inches. It is at once distinguishable from the other insular species by its greater height, and by the presence of black humeral and caudal spots. It appears to be very nearly allied to the Tetragonopterus Linnæi of Valenciennes, or the Albula maculata of Linnæus. The former, which is probably the same as the Linnæan species, is an inhabitant of Cayenne.

We have dedicated it to Mr. J. Carson Brevoort, of the city of Brooklyn, whose profound knowledge of the North American marine fishes, and especially those of the family of Scombroids, to which his memoir on the "lost fish," Selene argentea of Lacepede, bears testimony, places him among the first of ichthyologists.

Pœcilurichthys tæniurus, Gill.

VERNACULAR: *Sardine.*

Body slender, with a subfusiform outline, four times longer than high. The head, from the snout to the margin of the

the margin of the fin, and is bordered above and below by yellow; the remainder of the fin is white; the anterior rays of the first dorsal and adipose fin are red. The other fins and the operculum are silvery. There is a humeral spot as in *P. Brevoortii Gill.*

The average length of this species is less than three inches. Its distinctive characters reside in the slender body, and the uniform black band running along the median rays of the caudal fin, and bordered above and beneath with yellow.

Pœcilurichthys pulcher, Gill.

VERNACULAR: *Sardine.*

The outline of the body is oval, and including the caudal, is three and two-fifths longer than the height at the dorsal. The head forms three-sixteenth parts of the entire length of the body; the eyes are very large, their diameters being nearly one-third of the length of the head; they are separated from each by a space equal to one of their diameters, and by two-thirds of that distance from the snout. The distance of the dorsal from the snout is more than double the length of the head. The ventrals do not extend as far back as the anal.

D. 10. A. 22. C. 7. 8. 8. P. 20. V. 8.

The body is chiefly of a greenish yellow color, with a silvery band running along the sides; an obscure humeral blotch is generally perceptible; at the end of the caudal peduncle there is a black spot, which is bordered above and below by red, or sometimes yellow blotches. The dorsal and anal fins are white, tinted with red; on the operculum there are blotches of a bright golden color.

This species is readily distinguished by its smaller size, which rarely exceeds one inch and a half; by the golden markings on the opercula, which are seen in neither of the preceding species, and by the red or yellow blotches above and beneath the black caudal spot. It associates in large numbers, and is very familiar, approaching the bather, and nibbling at his legs and body.

Subgenus.

HEMIGRAMMUS, GILL.

Lateral line abruptly discontinued at the middle of the body.

Pœcilurichthys unilineatus, Gill.

The height of the body, before the dorsal, is contained three times and a fifth in the total length from the snout to the end of the lobes of the caudal. The length of the head bears to that length the proportion of three to thirteen. The eyes are very large, and only contained three and two-seventh times in the head's length; the distance between them is less than the diameter, and a space equal to only four sevenths of the diameter separates them from the snout. The dorsal com-shoulder and tail also distinguish it. Like Pœciluricbthys pulcher, its opercula have golden blotches.

Sub-family.

CURIMATINÆ, GILL.

Genus.

CURIMATUS, CUV., VAL.

Body with a sub-fusiform or oval outline, compressed, covered by moderate or small scales.

Head moderate, compressed, with the profile sub-conical; broad, and generally rounded above; third sub-orbital large and covering the cheeks.

Mouth small and with a subquadrate gape, placed at the extremity of the snout. The margin of the upper jaw is formed above by the thin and trenchant intermaxillaries, which are movable but not protractile, and on the sides by the small maxillaries. The maxillaries, intermaxillaries, and dentaries are edentate; the margins of the latter, like those of the intermaxillaries, are trenchant; at their symphisis is a tubercle, which is received into a corresponding notch in the upper jaw.

Opercula with the margins rounded.

Lateral line continued in a straight line to the end of the tail.

Dorsal subquadrate, as high, or higher than long, placed over the bases of the ventrals.

Adipose fin pedunculated, opposite the anal.

Anal with the base short, and generally exceeded by the length of the first ray.

Pectorals moderate and not pointed, the first ray not being longest.

Ventrals moderate and triangular, with spiniform axillary scales.

Caudal deeply emarginate.

Curimatus argenteus, Gill.

VERNACULAR: *Silver-fish.*

Body sub-fusiform, highest at the anterior base of the dorsal, where it is three-tenths of the entire length; the greatest thickness is contained two and a third times in its height. The head, from the muzzle to the angle of the operculum, is contained four times and two-thirds in the entire length; the distance from the muzzle to the nape is only two-thirds of this length. The diameter of the orbit is greater than the space that intervenes between it and the muzzle, and is contained little more than three times in the total length of the head; the distance between the orbits surpasses by more than a third their respective diameters. The commencement of the dorsal is less than a third of the length of the body nearer the snout than the end of the caudal. The lateral line runs through thirty-seven scales; thirteen obliquely cross the body from the front of the dorsal to the belly.

D. 10. A. 8. C. 3, 10, 9, 2. V. 9. P. 13.

In the posterior position of the dorsal, which is placed over the anal, it resembles the genus Gasteropelecus of Bloch, and Serpes of Lacepede. It bears a further resemblance to that fish, as well as to Anastomus of Cuvier, and Piabucina of Valenciennes, in the oblique fissure of the mouth. In the armature of the mouth, it resembles Tetragonopterus of Artedi, and the allied genera, having like them two rows of compressed teeth, whose cutting margins are each armed with several triangular points, of which the middle is largest. A character which may serve to distinguish it, in addition to the want of an adipose fin, is in the operculum, which, in all known species, is more or less extended, sometimes armed with a posterior spine, but generally terminating in a claviform process, or in a slender filament. The dorsal is also much higher than long, and exceeds in height, but is much shorter than, the anal; the last posterior rays of the latter fin are generally longer than those which precede them, and in one genus, that fin regularly increases towards the posterior margin. The sub-orbitals are nearly similar to those of the Tetragonopteri.

Genus.

STEVARDIA, GILL.

Body subfusiform, compressed, covered by moderate scales; abdomen rounded.

Head with the lateral aspect subconical, compressed.

Mouth oblique, moderate, narrow, with the gape elongated elliptical. The teeth of the dentary, when the mouth is closed, are received behind those of the exterior row of the intermaxillaries, but on account of the obliquity of the mouth, the lower jaw projects considerably beyond the upper.

Teeth in two rows on the intermaxillaries, and in a single one on the dentaries; these are wide, compressed, widening towards the crowns, which are multicuspid, with the median cusp longest.

Nasal apertures with their common border circular, large, and situated near the eyes, and on a line between them and the snout.

Operculum with a triangular, spiniform dilatation behind; cheeks entirely covered by the large third sub-orbital.

Lateral line deflected for a short distance from the mastoids, and thence running in a nearly straight line to the tail.

Dorsal posterior, over the middle of the anal, with the height not greatly exceeding the length.

Anal rather long, with the height moderate, decreasing towards the posterior termination.

Caudal deeply forked, with the lobes subequal.

Ventrals very small, with the external rays longest.

Pectorals moderate, pointed, with the external rays longest.

We are generally averse to the dedication of groups of species to individuals, and admit its expediency in only few and exceptional instances, but in this case we believe that we shall be justified in so doing: we have taken peculiar pleasure in dedicating to our excellent friend, Mr. Jackson Steward, of

Stevardia albipinnis, Gill.

Body subfusiform, elongated, with the dorsal outline slightly arched, and the abdominal outline, as far as the termination of the anal, convex. The head, from the snout to the end of the opercular spine, bears a proportion to the entire length, inclusive of the caudal, of little less than one to five and a third, and its length is considerably less than the greatest height of the body. The diameters of the eyes are about three-tenths of the length of the head; they are separated from each other by a space exceeding one of those diameters, and their distance from the snout is less than a diameter. The dorsal commences on the posterior half of the body, above the seventh or eighth ray of the anal, and is about a third higher than long. The lateral line runs through about forty scales.

D. 10. A. 20. C. 6. I. 8. 9 I. 5–8. P. 10. V. 6.

The body is yellowish green, with a black line on the side, extending from a point in advance of the dorsal to the caudal. Opercular bones silvery; all the fins are white.

Genus.

CORYNOPOMA,* GILL.

Body subfusiform, compressed, covered by moderate scales; abdomen rounded.

Head compressed, with the lateral aspect triangular.

Mouth opening obliquely upwards, moderate, with the gape elongated, elliptical. Lower jaw advanced beyond the upper, but with the single row of teeth received between the external and internal rows of the latter.

Teeth multicuspid, with the median cusps largest, in two rows on the intermaxillaries, and in one row on the dentaries.

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* Κορυνη, club, and Πωμα, operculum, in allusion to the claviform prolongation of the operculum.

Nasal apertures near the antero-superior corners of the eyes.

Operculum with a posterior triangular dilatation, from the extremity of which issues a more or less long and slender compressed process.

Lateral line deflected at its commencement, but soon continued in a straight line, on the flank, to the caudal fin.

Dorsal posterior, above the middle of the anal, much higher than long, with the base short.

Anal long, of moderate height, and decreasing posteriorly.

Caudal deeply forked, with the lobes of nearly equal length.

Ventrals very small, pointed.

Pectorals moderate, pointed, with the superior rays longest.

The most important peculiarity, which distinguishes this genus from Stevardia, is the claviform extension of the operculum.

Corynopoma Riisei, Gill.

The general shape of the body is similar to that of the

The dorsal commences at a distance from the snout equal to three lengths of the head; the length of the base of this fin is about three sevenths of that of the longest rays. The base of the anal has a length almost three times as great as the dorsal's, but its longest rays are considerably shorter than those of the latter fin; the last two or three rays are longer than those which immediately precede them.

D. 8. A. 27. P. 10. V. 6.

The color is nearly similar to that of Stevardia albipinnis.

Mr. A. H. Riise of the Danish island of St. Thomas, the gentleman to whom this species has been dedicated, is well known as one of the most active zoologists of the West Indies, and has greatly contributed to our knowledge of the terrestrial Mollusks, and the Echinoderms, by his contributions to Dr. Louis Pfeiffer, and Dr. A. Lutken.

Corynopoma Veedonii, Gill.

This species resembles in the general shape of the body, and in its size, *Stevardia albipinnis*, and *Corynopoma Riisei*. The head is slightly longer in proportion to the total length, and the eyes are rather smaller, but the chief difference consists in the greater length, and the direction of the claviform prolongation of the operculum; this appendage, instead of being deflected downwards for its entire length, descends only at the base, and very soon advances upwards with a curve, and is continued in a nearly straight line, and in a direction towards the anterior portion of the dorsal; it terminates on a line with the base of the ventral; its size is nearly equal from its point of curvature to the termination.

The dorsal commences at nearly the same distance from the snout as in the *Corynopoma Riisei*, and its proportion varies little from those of the latter species, its height being more than double the length of the base. The anal is not quite as long in proportion to the dorsal as in the *C. Riisei;* its first and longest rays are more than three quarters of the length of the dorsal's; the subsequent rays gradually decrease in length towards the posterior portion of the fin, but the last three or four rays are produced beyond the others as in the *C. Riisei.*

D. 9. A. 31. P. 10. V. 6.

The color is, as in the preceding species, silvery green above, and white beneath, with a black line posteriorly on the sides and caudal peduncle; there is also a rose-colored band, in the living animal, on each side.

Genus.

NEMATOPOMA,* GILL.

Body subfusiform, compressed, covered by moderate scales; abdomen convex and rounded.

Head compressed, with the profile sub-conical.

Mouth opening obliquely upwards, moderate, with the gape elongated elliptical. Lower jaw advanced beyond the upper, but with its single row of teeth received in the space between the outer and inner rows of the latter.

Teeth in two rows on the intermaxillaries, and in a single

Anal long, and high, increasing posteriorly.

Caudal very deeply forked, and with the lower lobe much longer than the upper.

Ventrals small, pointed behind.

Pectorals moderate, pointed, with the external rays longest.

This is readily distinguishable from all the allied genera of the sub-family by the slender filament of the operculum, the unequally lobed caudal, the excessively high dorsal, and the anal, which regularly increases in height from the anterior to the posterior end, a character which is hardly possessed by any other fish.

Nematopoma Searlesii, Gill.

The body is slender, subfusiform, with the abdominal outline to the end of the anal much more arched than the dorsal; the head, from the snout *to the occipital crest*, forms one fourth of the length *exclusive of the caudal*, one fifth of the length to the end of the upper lobe of that fin, and one sixth of the length to the end of the filamentary termination of the lower lobe. The eyes are large, their diameters exceeding a third of the head's length as previously measured; they are separated by more than a diameter from each other, and less than a diameter intervenes between them and the snout. The dorsal commences above the fifth or sixth ray of the anal, and when bent back extends beyond the peduncle of the tail; its longest rays are five times the length of the base of the fin; the length of the base of the anal is nearly three and a half times greater than that of the dorsal, but its height is not much greater than half of that fin. The opercular filament is expanded at the extremity, and reaches to a point behind the dorsal. The pectorals, extending as far back as the ventrals do, pass beyond the anterior margin of the anal.

D. 10. A. 26. C. 2. I. 8. 9 I. 4. P. 10. V. 6.

The color is the same as in Stevardia albipinnis.

NOTE ON THE GENUS CTENOGOBIUS.

This genus, first described at page 374, proves to have been insufficiently characterized. The form of the head, in comparison with some other species of Gobies, can scarcely be said to be *long*, and the plan of stating the extent of the squamation, adopted in describing the other genera, was omitted in the diagnosis of the present one. To remedy this defect, and to more accurately restrict the genus, the following amendments are made:

The head is inflated, laterally oblong and subquadrate, and with the profile before the eyes very descending. The eyes are in the anterior portion of the head, nearly horizontal, and closely approximated. The head, vertex, and nape are destitute of scales, and the bare space extends, in the typical species, to the front of the dorsal fin.

The cleft of the mouth extends little further back than the anterior border of the eye.

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[The names of new species, or concerning which new information is given, are printed in Roman letter; and the first numbers indicate the pages on which the new matter will be found: synonyms, and species to which only incidental reference is made, are in *Italics;* and names of families or higher divisions in SMALL CAPITALS.]

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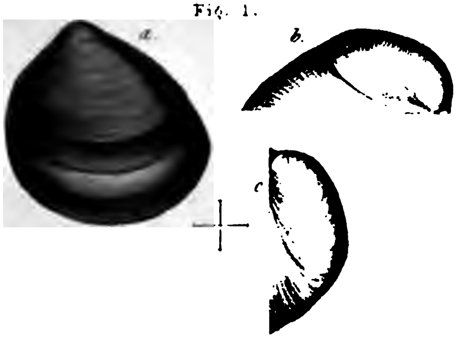
ERRATA.

PAGE **78**, 18th line from the top, *after*, "to show," *insert* "absence of."
135, 15th " " " *for* tuberoles read pillars.
161, 5th " " " " *astiva* " *æstiva*.
202, 8th " " " " Honukawai " Honakawai.
215, 21st " " " " Keowaawa " Keawaawa.
218, 2nd " " bottom " Waialoe " Waialae.
221, 10th " " " " *dele* Pl. *VII.* Fig. 42 *b*.
221, at foot of the page, *insert* Pl. *VII.* Fig. 42 *b*.
224, 3d line from the bottom, *for* Jeie read Ieie.
255, at foot of the page, " basi " base.
256, 2nd line from the top, " valido " valida.
" 5th " " " duo " duobus.
" 8th " " " marulâ " maculâ.
" 10th " " " basi " base.
276, 5th " " " P. CHRYSOCAULOSUS read C. CHRYSOCAULOSUS.
" " " " " *P. auratus* " *C. Auratus.*
291, 7th " bottom " p. 21, read p. 191.
345, 14th " " " say " Say.
374, 16th " " " Arouco " Arouca.
391, 16th " " " **Pimelotus** read **Pimelenotus.**
426, 14th " " " external read supra.

Fig. 1.



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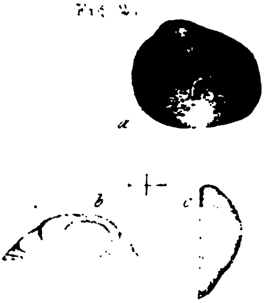

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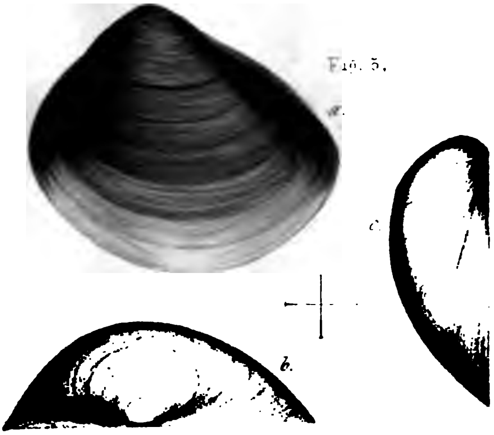

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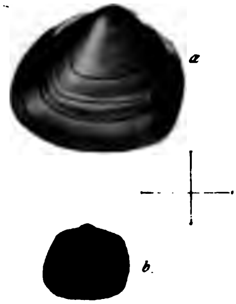

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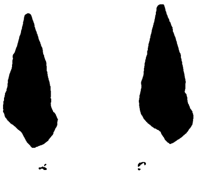

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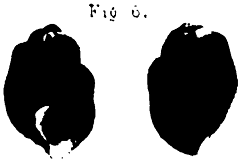

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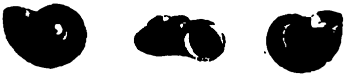

Lith of Nagel & Weingartner N Y

Fig. 1, Pisidium *cicer* Prime
„ 2, „ *contortum* „
„ 3, „ *Noveboracense* „

Fig. 4. Cyclas *rhomboidea* Say.
„ 5. Melania *gracilior* Anth.
„ 6. Anculosa *Anthonyi* Budd.

Fig 7. Cyclostoma *inornatum* Redf.

Plate II.

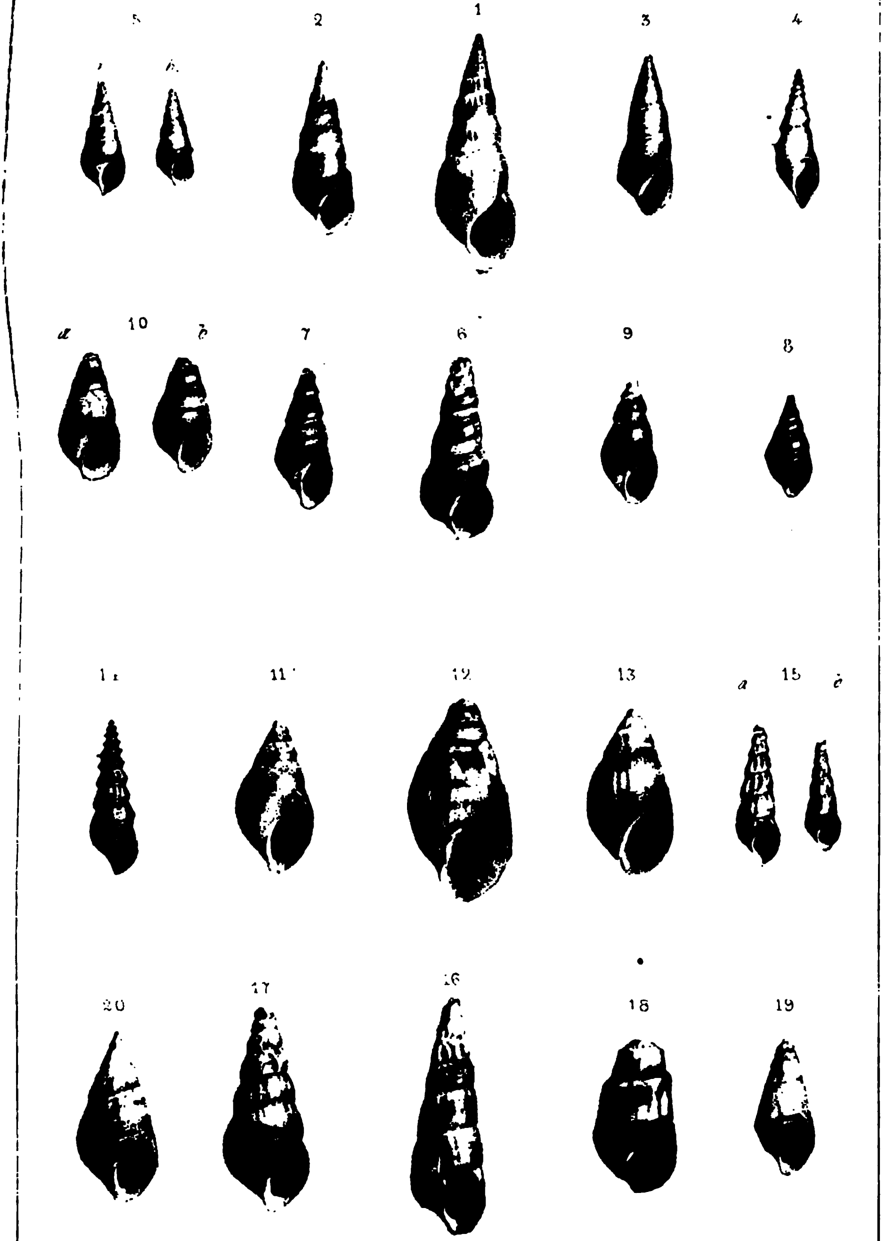

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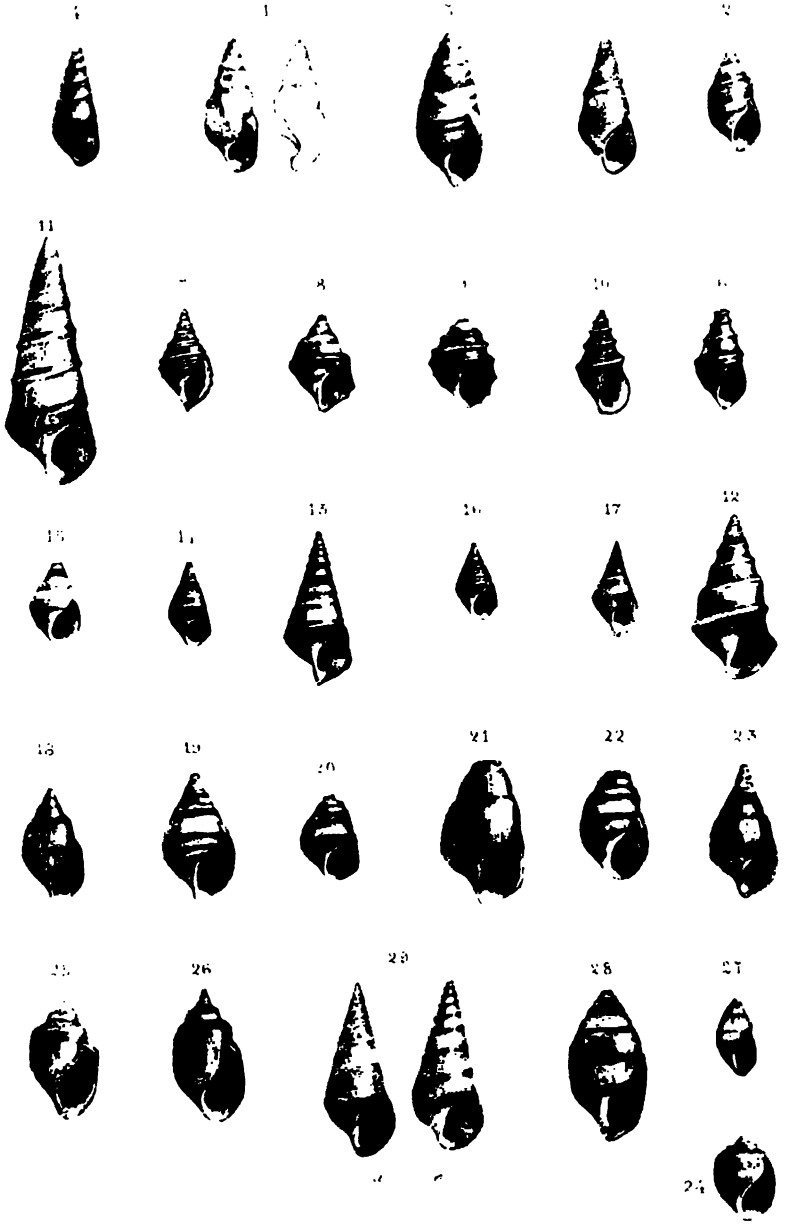
Plate III



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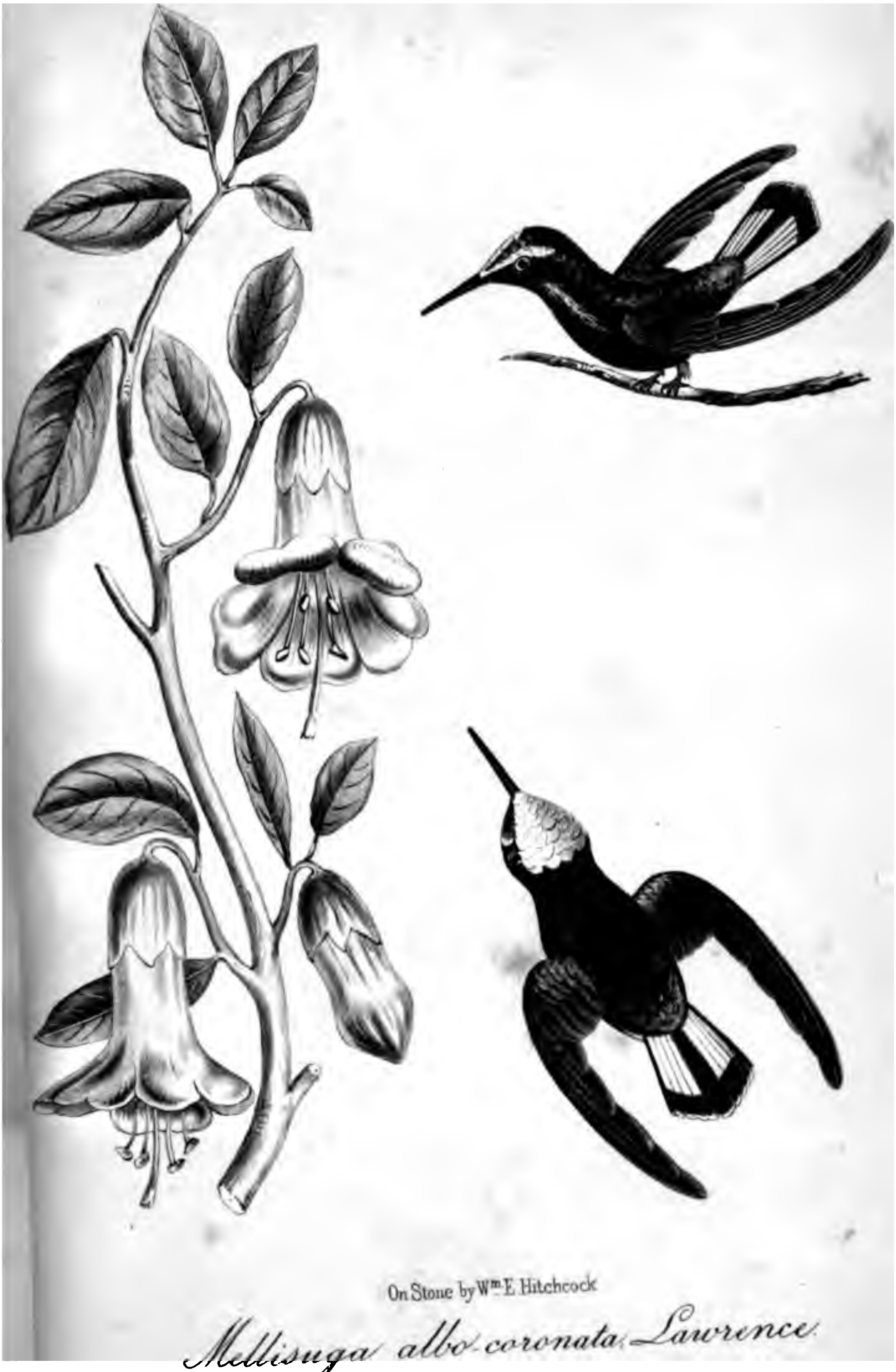

On Stone by W^{m} E Hitchcock

Mellisuga albo-coronata, Lawrence.

Adult and Young Natural Size

Printed & Col^{d} by J.T.

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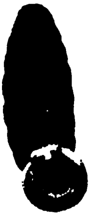

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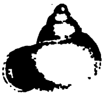

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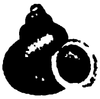

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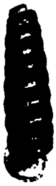

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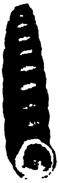

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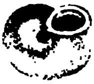

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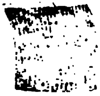

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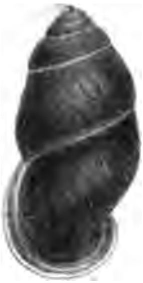

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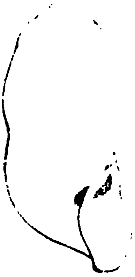

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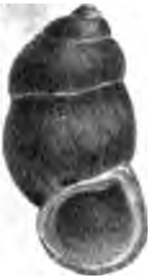

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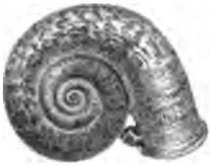

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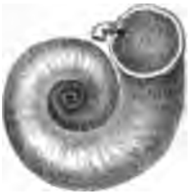

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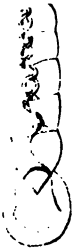

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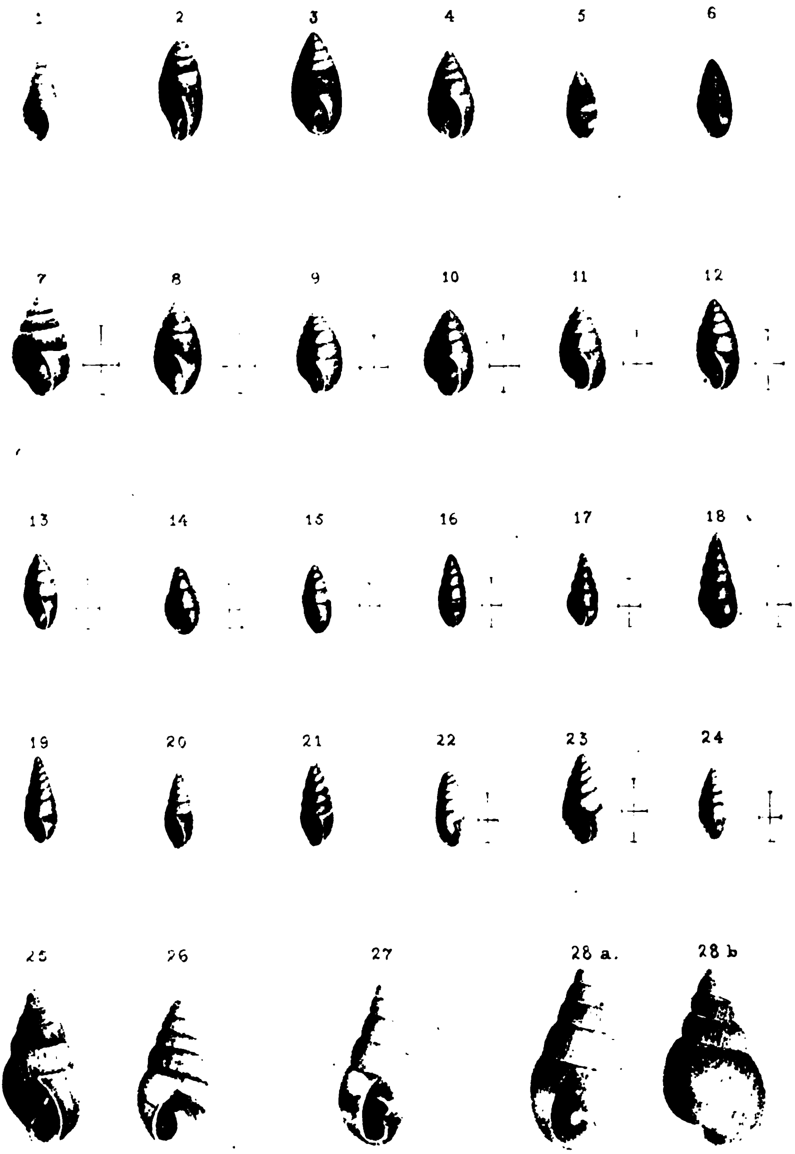
A. Weingärtner's Lith. N.Y.

Plate VI



A. Weingartner's Lith. N.Y.

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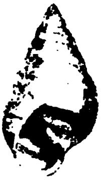

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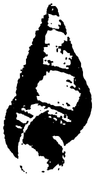

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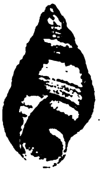

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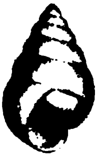

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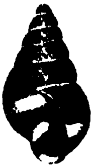

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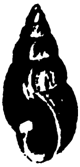

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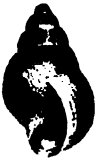

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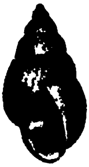

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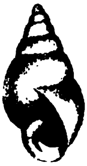

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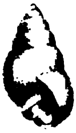

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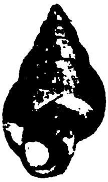

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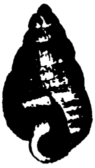

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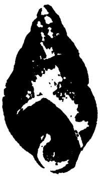

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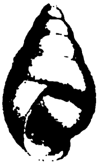

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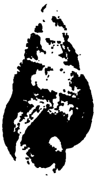

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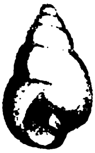

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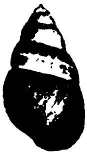

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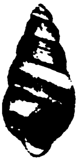

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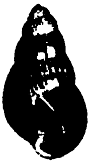

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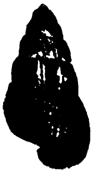

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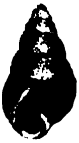

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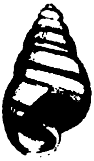

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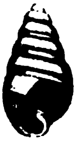

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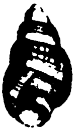

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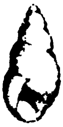

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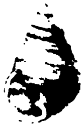

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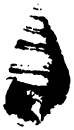

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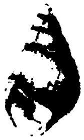

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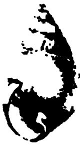

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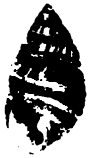

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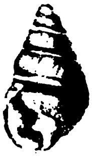

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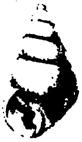

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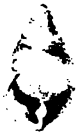

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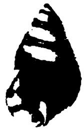

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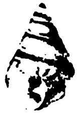

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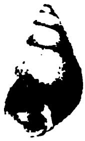

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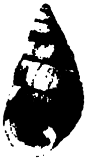

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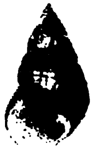

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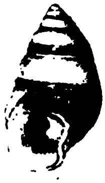

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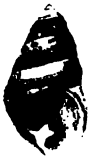

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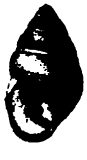

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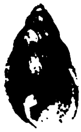

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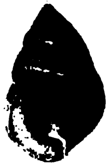

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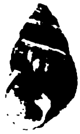

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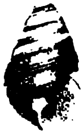

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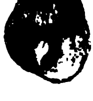

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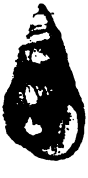

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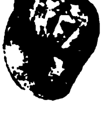

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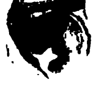

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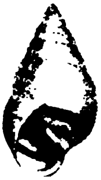

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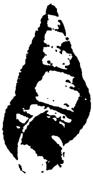

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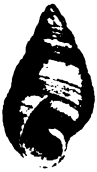

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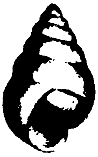

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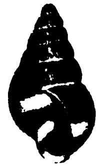

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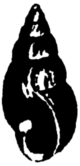

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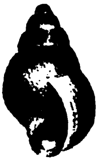

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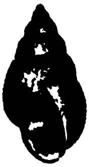

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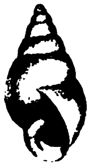

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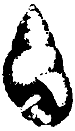

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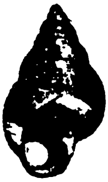

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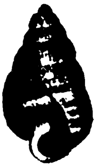

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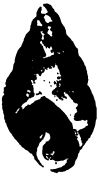

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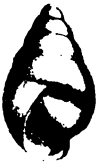

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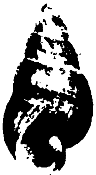

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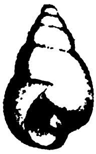

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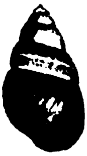

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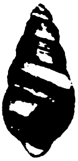

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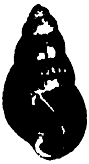

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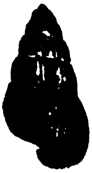

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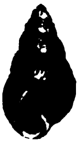

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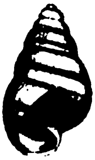

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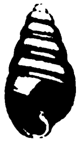

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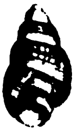

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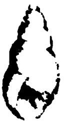
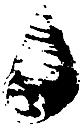


A. Weingärtner's Lith. N.Y.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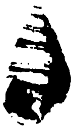
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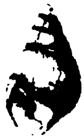
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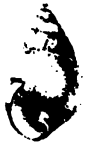
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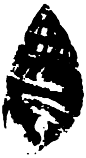
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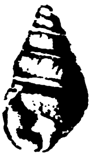
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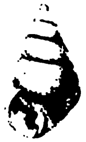
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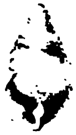
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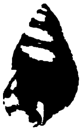
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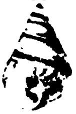
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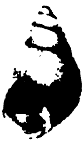
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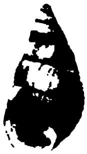
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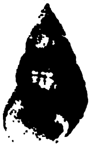
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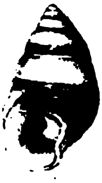
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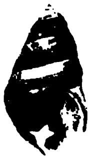
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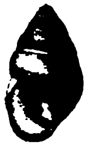
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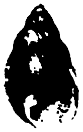
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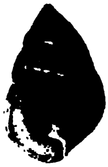
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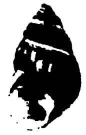
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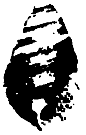
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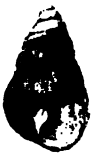
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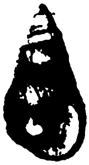
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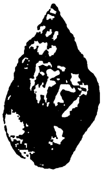
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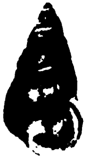
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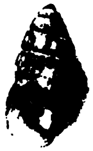
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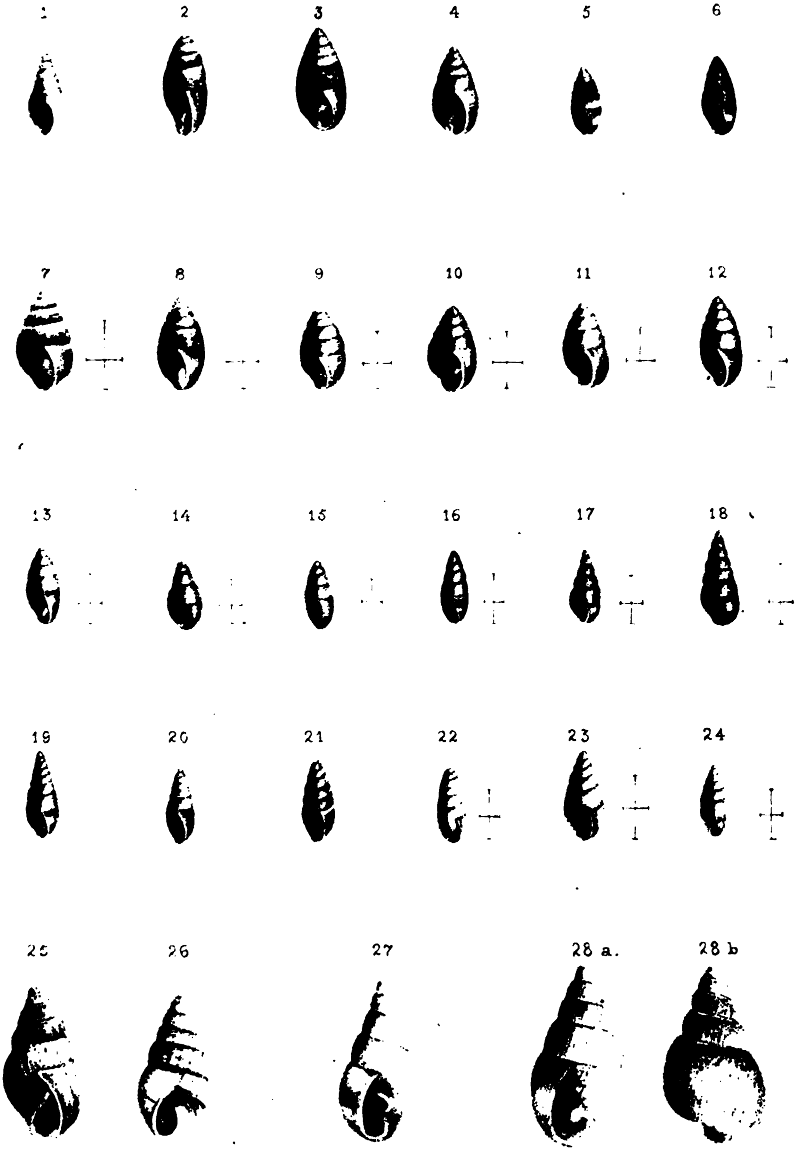
wd. W. Magens N.Y. Del.

Lith. of Endicott & C^{o} N.Y.

Plate VI.



A. Weingärtner's Lith. N.Y.

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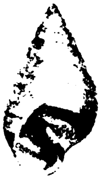

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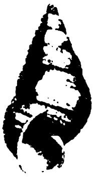

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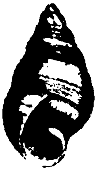

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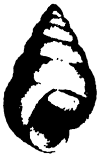

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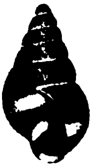

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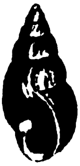

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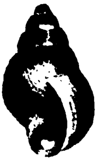

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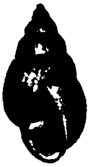

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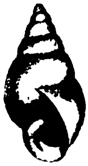

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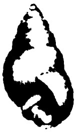

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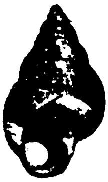

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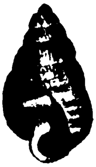

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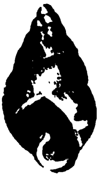

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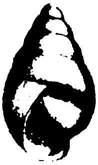

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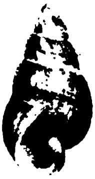

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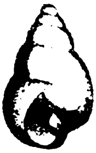

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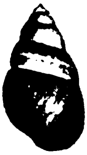

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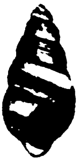

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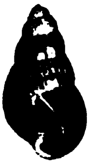

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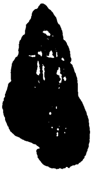

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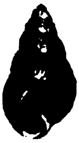

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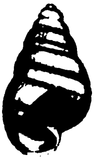

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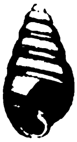

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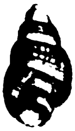

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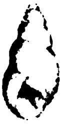

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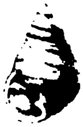
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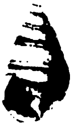
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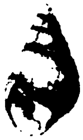
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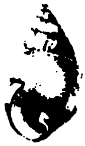
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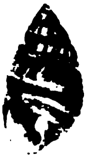
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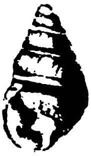
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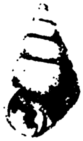
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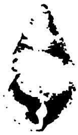
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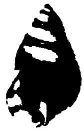
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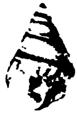
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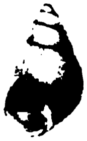
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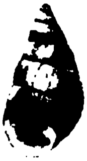
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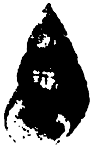
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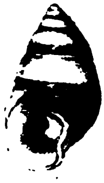
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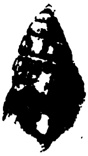
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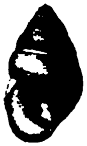
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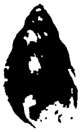
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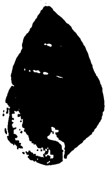
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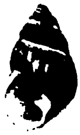
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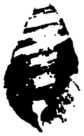
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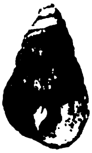
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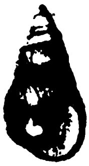
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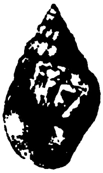
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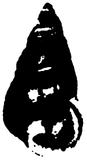
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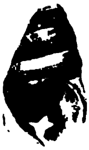

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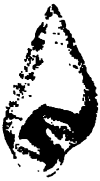

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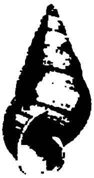

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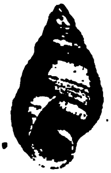

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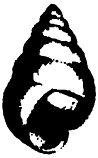

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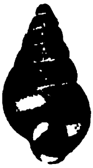

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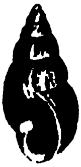

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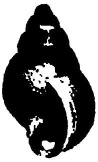

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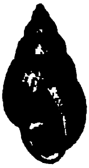

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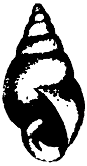

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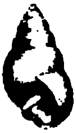

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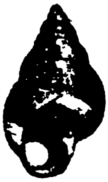

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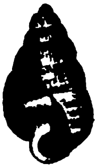

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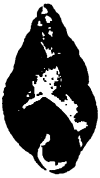

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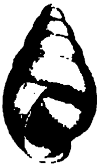

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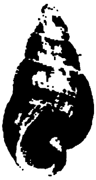

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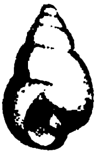

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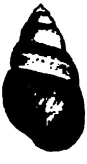

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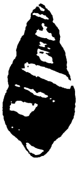

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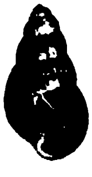

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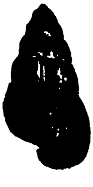

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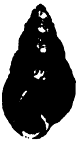

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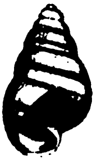

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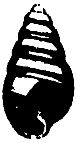

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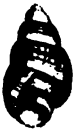

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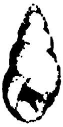

A. Weingärtners Lith Y. N.Y.

Plate VIII.

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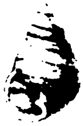

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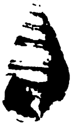

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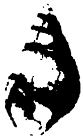

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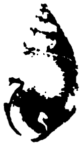

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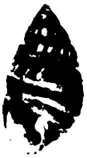

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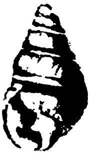

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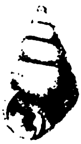

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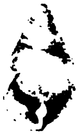

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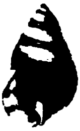

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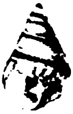

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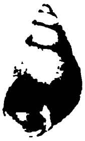

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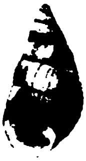

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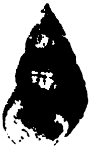

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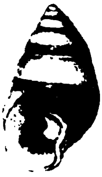

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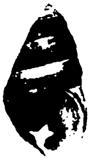

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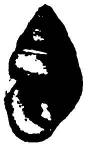

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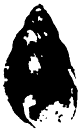

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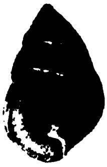

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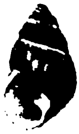

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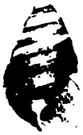

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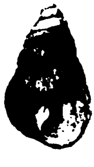

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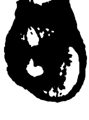

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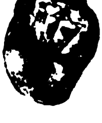

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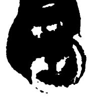

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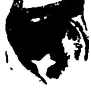

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Plate VII.

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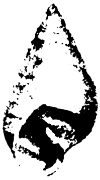

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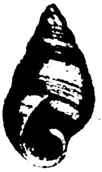

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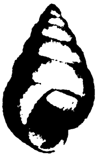

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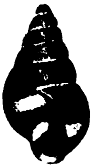

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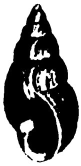

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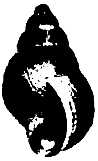

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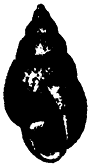

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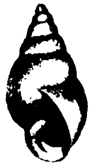

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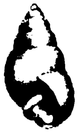

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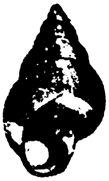

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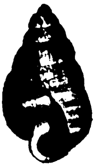

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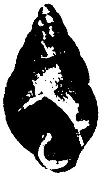

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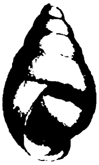

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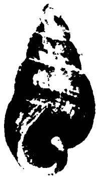

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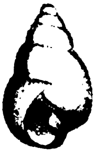

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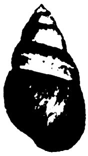

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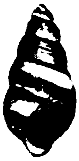

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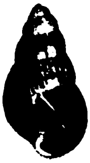

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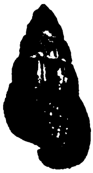

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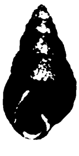

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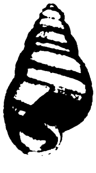

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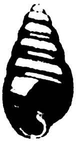

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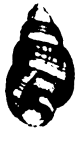

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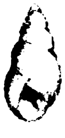

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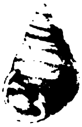
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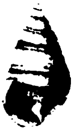
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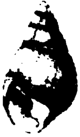
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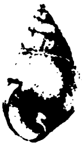
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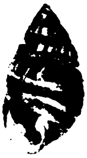

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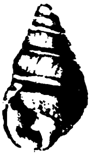
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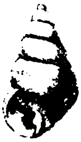
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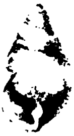
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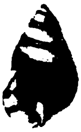
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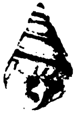

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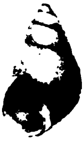
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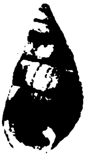
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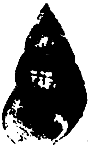
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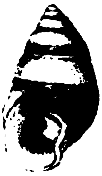
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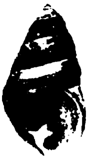

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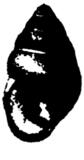
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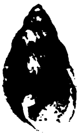
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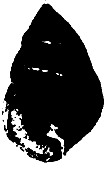
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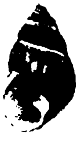
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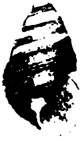

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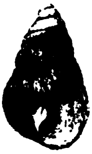
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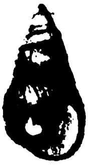
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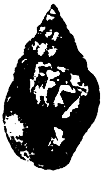
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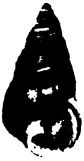
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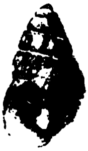

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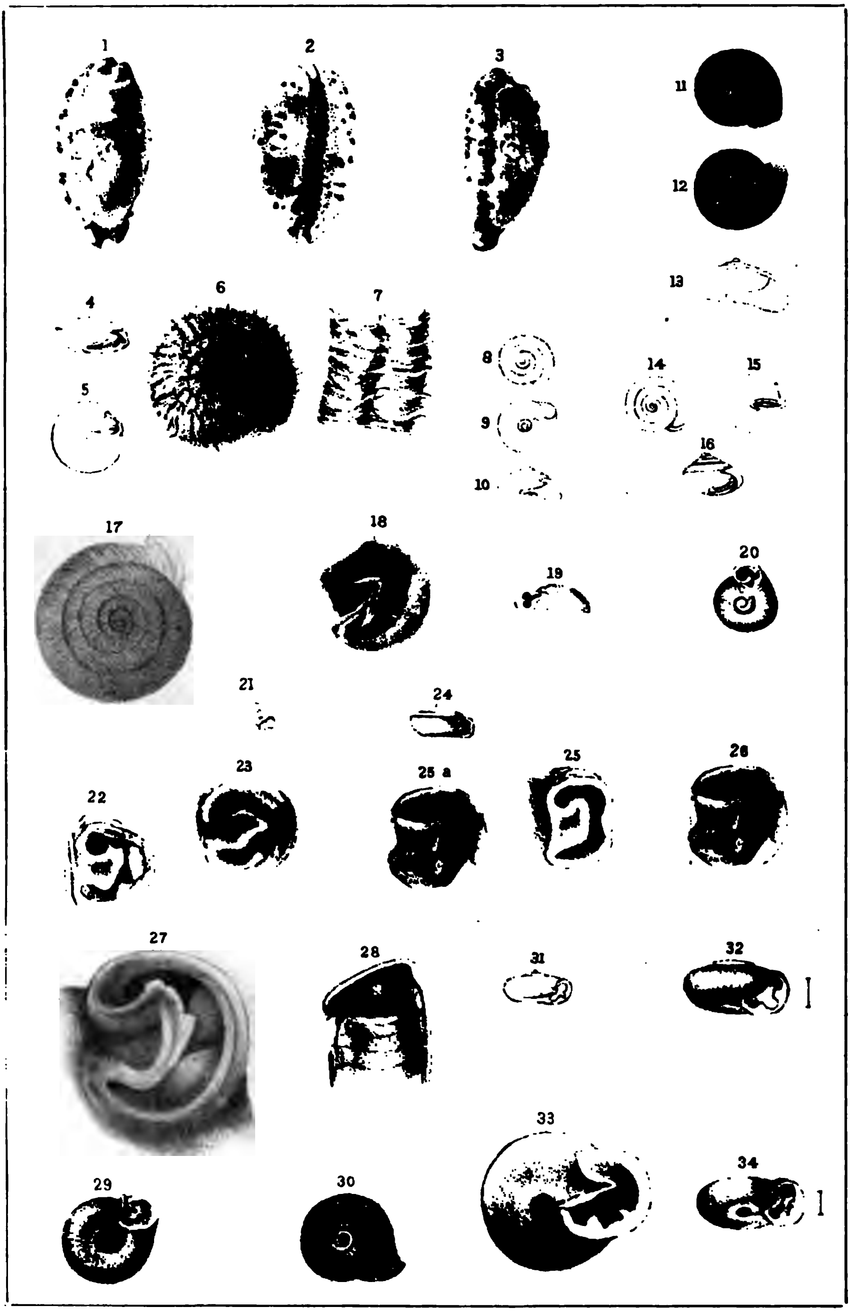
Plate IX.



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